

**Affordability and Availability of Personal Lines
Insurance
in Underserved Communities**



Missouri Department of Insurance

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Executive Summary

In 1993 and again in 1997, the Missouri Department of Insurance released reports on the availability and affordability of homeowners insurance in inner-city areas of Missouri. These earlier reports found indications that areas with high concentrations of minorities experienced significant market irregularities. This updated and expanded report includes a review of private passenger automobile insurance as well as homeowners insurance.

Findings

Pricing As occurred in 1997, no evidence of discriminatory pricing practices was found for automobile and homeowners insurance. While premiums charged in inner-city areas with large minority populations are significantly higher than elsewhere, premium levels appear to be commensurate with the risks covered (p. 10). Loss ratios, a key indicator of the “value” of coverage per premium dollar, tended to be slightly **higher** in high-minority areas between 1994 and 2003, indicating that the “price” of coverage is on average less in such areas. Loss ratios do not indicate that individuals residing in high-minority areas are over-charged relative to others. However, homeowners 2003 data depart from the historical pattern, such that high-minority areas experienced much lower loss ratios. This situation merits continued monitoring.

Market Penetration A lower proportion of homes in inner-city areas had coverage in the commercial market, and a greater share obtained policies in the surplus lines market or went without coverage altogether. In 2003, 92 percent of homes had coverage in low-minority areas, compared to 81 percent in high-minority areas (p. 13). The gap was much more significant for renters coverage, so that 33 percent of renters in low-minority areas possessed renters coverage in 2003, compared to 12.5 percent of renters in high-minority areas (p. 14). The gap in homeowners coverage remains after controlling for average premiums and socioeconomic variables. However, the gap in renters coverage seems to be primarily attributable to the lower median income levels found in urban neighborhoods with high-minority concentrations. Statistically controlling for such variables removed the gap in renters coverage.

Private automobile insurance market penetration rates indicated a very significant gap related to the racial composition of an area. In 1999 (latest available data year), nearly one-third of automobiles registered at addresses in high-minority areas lacked mandatory liability coverage, compared to less than

5 percent of vehicles in low-minority areas lacking coverage (p. 17). For the poorest one-fourth of Zip codes, more than 40 percent of vehicles in high-minority areas lacked coverage, compared to 4.6 percent of vehicles in the poorest one-fourth of predominately white neighborhoods. While socioeconomic status is highly correlated with the rate of uninsured vehicles, the statistical relationship between minority concentration and the rate of uninsured vehicles remains even after controlling for a variety of socioeconomic variables as well as average premium levels.

Agent Location Significantly fewer distribution channels exist in high minority and low-income areas, as indicated by a relative lack of agents. The disparity between high and low-minority areas remains after controlling for socioeconomic variables. Low-income areas have less than half as many agents, and high-minority neighborhoods have 44 percent fewer personal lines agents *per capita* (p. 19).

Residual Market Share Residual markets are state-established, industry-operated “markets of last resort,” which provide coverage for individuals who cannot obtain insurance from private insurers. While the overall market share of residual markets is quite small for homeowners and automobile coverages, a disproportionate share of consumers residing in high-minority areas purchase residual market policies, indicating possible market access problems in poorer inner-city areas. Though small in absolute terms, the 2003 market share of the homeowners residual market (FAIR Plan) was more than 12 times higher in high-minority areas compared to low-minority areas. The residual auto market (JUA) was over three times greater in high-minority areas (p. 21). Disparities remain even among areas characterized by similar income levels. For example, in the poorest one-fourth of high-minority areas, the FAIR Plan represented 5.8 percent of policies, compared to a 1.2 percent in economically similar, predominately white communities.

Policy Types and Risk Classifications Individuals residing in high-minority areas are placed in higher risk classes for automobile coverage more frequently than individuals residing in low-minority areas (p. 23). These communities also purchased a disproportionate share of homeowners policies that offer fewer benefits than more comprehensive policies (p. 26).

In 2003, 33.5 percent of drivers residing in high-minority areas were placed in an automobile risk class other than the preferred class, compared to 24.3 percent of drivers residing in predominately white Zip codes, a gap of 8 percentage points. This gap cannot be accounted for by income levels.

While a significant gap of 17.5 percentage points exists in the share of more limited-coverage homeowners policies sold in high-minority areas compared to predominately white neighborhoods, this gap largely occurs because of demographic differences other than race. Controlling for various socioeconomic characteristics of neighborhoods, minority concentration is not statistically associated with the type of homeowners policies sold in an area (p. 28). For example, there is a strong relationship between income and limited-benefit policies, with a 31 percent gap between the poorest and wealthiest one-fourth of communities (p. 26).

Insurance Availability: Market Shares of Largest Writers

The largest personal lines writers in Missouri do not have sales volumes in high-minority areas comparable to their overall market share in the state (p. 29). In 2003, the **combined** market share of the top 10 homeowners insurers in the state was 9.9 percentage points less in high-minority areas compared to predominately white areas. The gap for the top 10 automobile writers was 11.7 percent.¹ Market share disparities *may* indicate that underwriting, rating or marketing practices adopted by the state's largest insurers have a negative impact on high-minority and poorer communities, possibly impacting premium levels or the ability to obtain coverage at all. Disparities related to the racial composition of an area remain even after controlling for income and other socioeconomic variables.

Market Conduct: Consumer Complaints: While measuring service quality is difficult, patterned variations exist in complaint rates between demographic groups and geographic areas. Many insurance departments publish complaint data as one measure of quality. Complaint rates (per 10,000 exposures) are two to three times greater in areas with high concentrations of minorities, compared to areas with sparse minority populations (p. 34). Complaint rate differences remain after controlling for claim losses, income, and other socioeconomic variables.

Rating Territories-Private Passenger Automobile Insurance The automobile rating territories of the top 10 writers in Missouri contribute significantly to elevated automobile premiums in areas with high-minority concentrations and to a lesser degree in poorer communities. Most companies

¹ Figures are for the combined market share of the top 10 writers, and do not imply that a similar gap between high and low minority areas exists for every individual top 10 writer.

examined possess territories with very high concentrations of minorities, in some instances reaching almost 90 percent. Territorial rating factors tended to be significantly higher in areas with high minority concentrations, and those factors can more than double the cost of auto insurance for residents.² However, no evidence was found to indicate that territories are based on extra-actuarial considerations. As a test, a territory structure was created to establish a “base-line” measure against which to compare actual auto territories. The “base-line” territories tended to reproduce the high degree of racial concentration found in existing territories, suggesting that such territories correspond to geographic-based risk characteristics that are themselves associated with minority concentration.

² Correlation coefficients between territory rating factors and percent minority for the top 10 auto writers ranged from .59 to .69 (where coefficients can assume values ranging from 0 to 1).

Methodology

This analysis is based on two primary data sources: **a)** data from the 2000 decennial census, and **b)** personal lines insurance premium and loss data aggregated at the Zip code level, collected annually by the Missouri Department of Insurance. The combined data permits an analysis of insurance market characteristics, accounting for demographic factors that may impact market dynamics.

For both expository and methodological reasons, each indicator of affordability and availability presented below is treated in parallel fashion. Data is presented in tabular form by groups defined by minority density, median income, and by percent minority within each income group. The raw tables indicate any existing disparities across population segments.

The analysis also employs statistical techniques that isolate the unique and discrete impact of each variable on insurance affordability and availability, statistically “controlling” for other factors. The most commonly employed technique is called regression. These statistical models isolate the impact of racial composition of an area on insurance market behavior, irrespective of other socioeconomic characteristics, such as household incomes, median age of dwellings, median housing values and so forth. Technical methodological notes regarding statistical procedures, which are unlikely to be of interest to the general reader, are found in the appendices.

An initial correlation indicating market irregularities in high-minority areas can, after controlling for other factors, disappear or even reverse. For example, when insurance market disparities between racial groups are primarily attributable to income differences between racial groups, statistically “controlling” for income can reduce or eliminate the initial bivariate correlation. This fact should not be interpreted to mean that no disparities exist; but only that disparities that do exist are “explained by” or are “caused by” factors other than race.

Because very sparsely populated Zip codes are prevalent in Missouri, regression results are weighted by population, so that more populated Zip codes will have a proportionately greater impact on numerical results. In addition, a technique called “stepwise selection” is employed to minimize subjective influences on model design. Stepwise selection is an iterative algorithm that selects the model with the highest explanatory power out of a set

of many different models. At each iteration, variables lacking significant predictive power are removed from the model, and the model is subsequently recalculated. The process is repeated until an optimal solution is achieved.

The following analyses largely are based on Zip codes with a minority population of greater than 50 percent. These “high-minority” Zip codes, along with selected socioeconomic characteristics, are displayed in the table below. In general terms, residents of these Zip codes suffer from a significant degree of socioeconomic privation compared to statewide averages: they tend to lack educational and job opportunities, many fall within the poorest income quartile, and most have poverty rates well above the Missouri average. These factors can make inner-city residents particularly vulnerable to market conduct practices that can significantly hamper access to affordable homeowners and automobile insurance coverage.

**“High-Minority” Zip Code Demographics, 2000 Census
(Minority Population > 50% of Zip Code Population)**

| Zip Code | City | Population | % Minority | Median Household Income | Income Quartile | % Urban Households | % of adult Pop w/ No Education Beyond High School | Unemployment Rate | % Total Population Below Poverty | % Households Renters |
|-------------------------|-----------------|------------|------------|-------------------------|-----------------|--------------------|---|-------------------|----------------------------------|----------------------|
| St. Louis City | | | | | | | | | | |
| 63101 | Saint Louis | 1,327 | 72.1% | \$17,783 | Lowest | 100% | 61% | 14.9% | 32.1% | 95.8% |
| 63103 | Saint Louis | 4,603 | 60.0% | \$17,852 | Lowest | 100% | 51% | 17.2% | 29.9% | 98.0% |
| 63104 | Saint Louis | 19,088 | 60.5% | \$29,566 | Second | 100% | 43% | 9.6% | 27.8% | 63.7% |
| 63106 | Saint Louis | 10,553 | 96.6% | \$10,491 | Lowest | 100% | 75% | 25.1% | 51.9% | 85.4% |
| 63107 | Saint Louis | 16,313 | 92.3% | \$19,353 | Lowest | 100% | 73% | 22.1% | 38.5% | 55.7% |
| 63108 | Saint Louis | 20,890 | 52.7% | \$25,953 | Lowest | 100% | 35% | 12.9% | 23.3% | 73.5% |
| 63110 | Saint Louis | 20,163 | 59.2% | \$28,604 | Second | 100% | 52% | 13.7% | 23.6% | 60.3% |
| 63112 | Saint Louis | 22,678 | 84.5% | \$20,686 | Lowest | 100% | 53% | 14.2% | 34.5% | 63.5% |
| 63113 | Saint Louis | 16,101 | 99.1% | \$20,724 | Lowest | 100% | 68% | 15.3% | 29.9% | 53.9% |
| 63115 | Saint Louis | 25,238 | 99.3% | \$24,587 | Lowest | 100% | 63% | 15.1% | 25.3% | 44.4% |
| 63118 | Saint Louis | 30,222 | 63.4% | \$23,553 | Lowest | 100% | 68% | 14.1% | 31.8% | 62.7% |
| 63120 | Saint Louis | 13,268 | 96.5% | \$20,025 | Lowest | 100% | 73% | 22.8% | 36.4% | 41.8% |
| 63147 | Saint Louis | 13,190 | 90.1% | \$27,486 | Second | 100% | 62% | 12.3% | 19.5% | 33.7% |
| St. Louis County | | | | | | | | | | |
| 63133 | Saint Louis | 8,693 | 89.5% | \$23,733 | Lowest | 100% | 67% | 13.5% | 28.5% | 40.8% |
| 63121 | Normandy | 29,172 | 83.3% | \$32,422 | Second | 100% | 50% | 8.3% | 17.2% | 37.9% |
| 63130 | University City | 34,424 | 50.3% | \$41,580 | Highest | 100% | 29% | 17.4% | 13.5% | 38.3% |
| 63134 | Berkeley | 14,982 | 61.8% | \$34,134 | Third | 100% | 60% | 9.9% | 16.2% | 32.6% |
| 63136 | Jennings | 53,604 | 83.4% | \$31,032 | Second | 100% | 57% | 10.2% | 18.6% | 35.2% |
| 63138 | North County | 21,879 | 57.2% | \$37,367 | Third | 96% | 49% | 6.3% | 11.5% | 44.2% |
| 63140 | Berkeley | 789 | 91.0% | \$14,813 | Lowest | 100% | 76% | 33.0% | 54.8% | 58.5% |

| Zip Code | City | Population | % Minority | Median Household Income | Income Quartile | % Urban Households | % of adult Pop w/ No Education Beyond High School | Unemployment Rate | % Total Population Below Poverty | % Households Renters |
|-----------------------|-------------|------------------|--------------|-------------------------|-----------------|--------------------|---|-------------------|----------------------------------|----------------------|
| Jackson County | | | | | | | | | | |
| 64106 | Kansas City | 6,142 | 74.5% | \$18,775 | Lowest | 100% | 66% | 28.1% | 37.1% | 90.1% |
| 64108 | Kansas City | 6,785 | 73.6% | \$27,508 | Second | 100% | 55% | 13.3% | 21.3% | 64.0% |
| 64109 | Kansas City | 12,252 | 77.2% | \$22,006 | Lowest | 100% | 58% | 14.3% | 28.8% | 62.2% |
| 64110 | Kansas City | 17,842 | 63.1% | \$30,224 | Second | 100% | 42% | 6.8% | 23.5% | 51.1% |
| 64124 | Kansas City | 13,343 | 60.6% | \$25,029 | Lowest | 100% | 75% | 10.5% | 26.7% | 52.7% |
| 64126 | Kansas City | 6,800 | 54.2% | \$21,682 | Lowest | 100% | 80% | 12.7% | 34.1% | 47.4% |
| 64127 | Kansas City | 20,831 | 80.8% | \$21,868 | Lowest | 100% | 69% | 14.6% | 30.2% | 55.9% |
| 64128 | Kansas City | 14,774 | 94.5% | \$22,806 | Lowest | 100% | 67% | 16.5% | 28.7% | 42.1% |
| 64130 | Kansas City | 25,743 | 96.9% | \$24,266 | Lowest | 100% | 67% | 13.4% | 24.7% | 35.9% |
| 64132 | Kansas City | 15,956 | 83.8% | \$27,556 | Second | 100% | 57% | 11.5% | 23.4% | 46.8% |
| 64134 | Kansas City | 23,471 | 53.8% | \$39,176 | Highest | 99% | 48% | 5.4% | 9.9% | 31.1% |
| 64147 | Martin City | 743 | 83.4% | \$11,190 | Lowest | 98% | 69% | 28.6% | 53.7% | 97.7% |
| 64192 | Kansas City | 19 | 57.9% | \$90,957 | Highest | 100% | 71% | 0.0% | 0.0% | 100.0% |
| <i>Missouri Total</i> | | <i>5,595,211</i> | <i>16.2%</i> | <i>\$37,934</i> | <i>N/A</i> | <i>68%</i> | <i>51%</i> | <i>3.4%</i> | <i>11.4%</i> | <i>22.9%</i> |

The percentage of minority residents in an area is calculated based on individuals who identified themselves as anything other than non-Hispanic/Latino Caucasian on the 2000 census. The statewide percentages are as follows:

| Ethnic / Racial Group | Percent of Missouri Population in 2000 |
|--|---|
| White, Non-Hispanic/Latino | 84.9% |
| African-American | 11.2% |
| American Indian / Alaskan Native | 0.4% |
| Asian | 1.1% |
| Native Hawaiian and Other Pacific Islander | 0.1% |
| Person Reporting Some Other Race | 0.8% |
| Persons Reporting Two or More Races | 1.5% |
| Hispanic or Latino | 2.1% |

Source: Calculated from the US Census, 2000

See Appendix A for information about how postal Zip codes were “mapped” onto the Zip Code Tabulation Areas (ZCTAs) adopted for the 2000 census.

I. Price

For both automobile and homeowners coverages, premium levels are considerably higher in high-minority areas compared to low-minority areas. For a standard homeowners policy offering between \$70,000 and \$100,000 of coverage, individuals residing in high-minority areas paid an average annual premium of \$685 in 2003, compared to an average of \$542 for the same coverage in low-minority areas. This gap of 26.4 percent represents a significant increase over the prior year's difference of 18.8 percent, and doubles the gap of 13.7 percent found in 2001. The gap was even higher for automobile liability coverage. Individuals in high-minority Zip codes paid on average 38 percent more than individuals residing in low-minority Zip codes for identical liability coverage; this substantial price difference, however, has been relatively constant over the past decade.

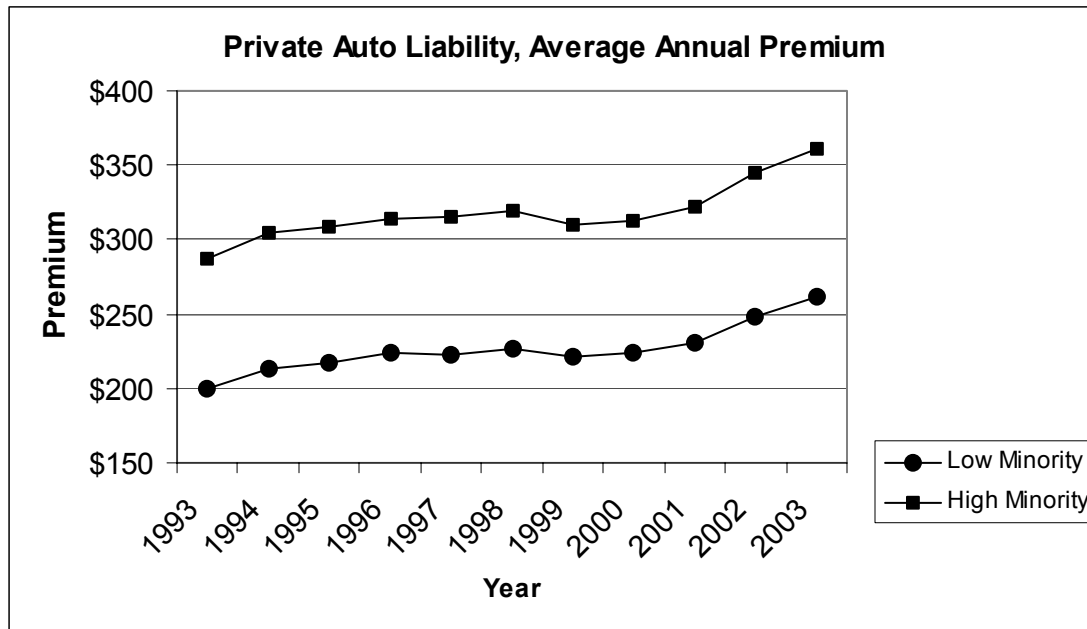
Table 1.1: Average Annual Auto and Homeowners Premium, by % Minority

| % Minority | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Homeowners, Policy Forms 1, 2, 3, and 5, Coverage Levels (See Below)* | | | | | | | | | | |
| Less than 20% | \$301 | \$307 | \$313 | \$329 | \$376 | \$388 | \$407 | \$433 | \$485 | \$542 |
| 20% to 50% | \$302 | \$310 | \$320 | \$337 | \$383 | \$388 | \$406 | \$438 | \$515 | \$592 |
| Over 50% | \$331 | \$336 | \$352 | \$373 | \$432 | \$440 | \$456 | \$492 | \$576 | \$685 |
| <i>**% Difference, High-Low</i> | <i>10.1%</i> | <i>9.4%</i> | <i>12.4%</i> | <i>13.4%</i> | <i>15.0%</i> | <i>13.4%</i> | <i>12.0%</i> | <i>13.7%</i> | <i>18.8%</i> | <i>26.4%</i> |
| Private Passenger Automobile, Liability, Preferred Drivers, Coverage Limit 50,000 / 100,000 | | | | | | | | | | |
| Less than 20% | \$213 | \$217 | \$224 | \$222 | \$227 | \$221 | \$224 | \$231 | \$248 | \$261 |
| 20% to 50% | \$262 | \$265 | \$271 | \$269 | \$274 | \$266 | \$270 | \$278 | \$302 | \$318 |
| Over 50% | \$304 | \$309 | \$315 | \$316 | \$320 | \$310 | \$312 | \$323 | \$345 | \$361 |
| <i>% Difference, High-Low</i> | <i>42.7%</i> | <i>42.3%</i> | <i>40.3%</i> | <i>42.2%</i> | <i>40.8%</i> | <i>40.2%</i> | <i>39.4%</i> | <i>39.7%</i> | <i>39.1%</i> | <i>38.3%</i> |

*Homeowners coverage levels are not comparable through all years. Coverage ranges changed as follows: 1993-1997: \$50,000-\$74,999
1998-Present: \$70,000-\$99,999

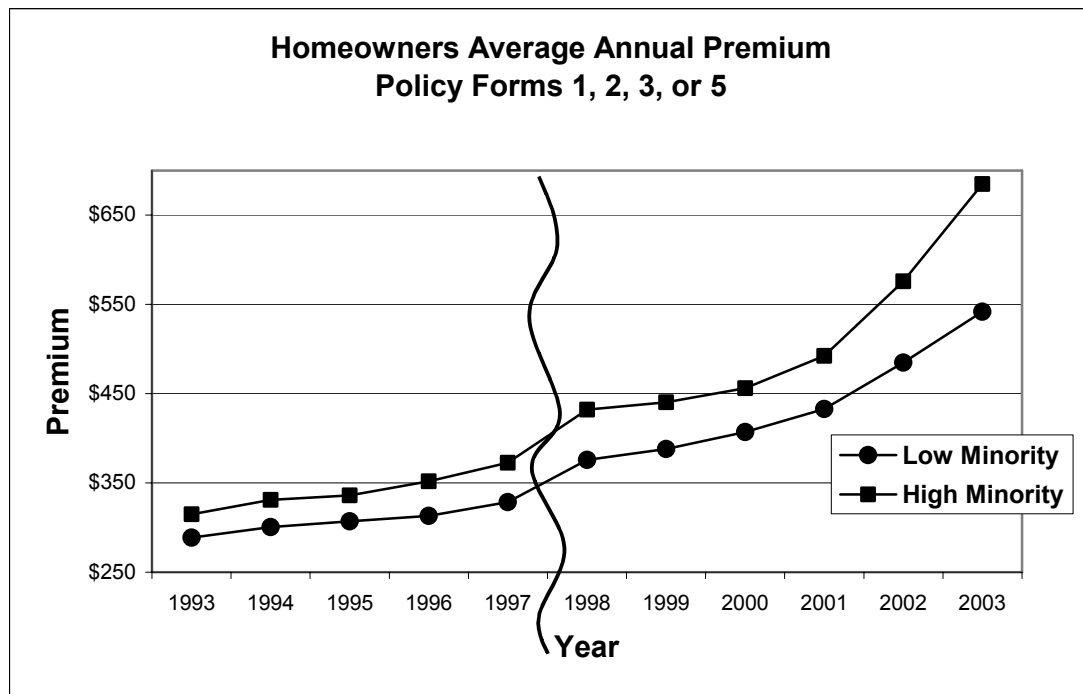
**Percent difference between high and low minority areas (over 50 percent and under 20 percent minority areas)

Figure 1.1



Preferred driver, \$50,000/\$100,000 Coverage

Figure 1.2*



Coverage levels are not comparable through all years. 1993-1997: \$50,000-\$74,999; 1998-2002: \$70,000-\$99,999

In spite of significant gaps in average automobile and homeowners insurance premiums between high- and low-minority areas for the same or similar coverage, no evidence was found that might indicate systematic discriminatory pricing practices. **Loss ratios** provide a good measure of the degree to which premiums are commensurate with risk. Loss ratios for high and low-minority areas are displayed in Table 1.2.

If individuals residing in high-minority areas are systematically overcharged, then such areas will tend to exhibit loss ratios that are lower than those of low-minority areas. Lower loss ratios would indicate that individuals are charged disproportionately more per unit of risk; or alternatively, that consumers have a lower “return” for the premium paid. No such pattern is found. For homeowners coverages, loss ratios were *higher* in high-minority areas for eight of the past 10 years (1994-2003). However, the loss ratio for homeowners coverage in high-minority areas decreased significantly in 2003 to levels well below predominantly white neighborhoods, a development that merits monitoring in the future.

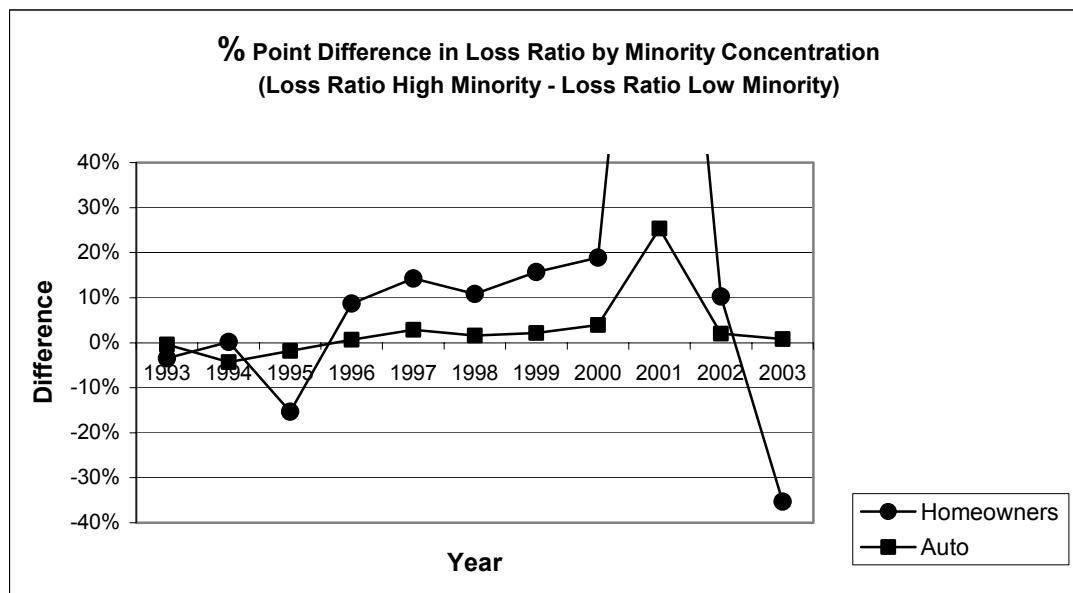
Similarly, loss ratios for private passenger automobile coverage were higher in high-minority areas for eight of the prior 10 years.³ Loss ratios displayed by coverage or policy types reveal similar patterns. The heightened exposure to various perils in core urban areas seems to account for elevated average premiums in high-minority areas.

Table 1.2: Loss Ratio by % Minority, Homeowners and Private Passenger Auto

| % Minority | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|--------------|---------------|-------------|--------------|--------------|--------------|--------------|---------------|--------------|--------------|
| Total Homeowners Insurance | | | | | | | | | | |
| Less than 20% | 68.8% | 82.1% | 72.3% | 48.9% | 57.0% | 58.7% | 59.5% | 123.1% | 75.3% | 79.4% |
| 20% to 50% | 56.1% | 59.6% | 74.7% | 59.1% | 63.3% | 62.7% | 70.0% | 461.9% | 108.9% | 44.3% |
| Over 50% | 69.0% | 66.8% | 81.0% | 63.2% | 67.8% | 74.3% | 78.3% | 276.9% | 85.6% | 41.1% |
| <i>Difference, High - Low</i> | <i>0.1%</i> | <i>-15.3%</i> | <i>8.7%</i> | <i>14.3%</i> | <i>10.8%</i> | <i>15.7%</i> | <i>18.9%</i> | <i>153.7%</i> | <i>10.3%</i> | <i>-38.3</i> |
| Total Private Passenger Automobile Insurance | | | | | | | | | | |
| Less than 20% | 65.5% | 65.0% | 62.9% | 61.4% | 61.5% | 64.6% | 64.3% | 72.7% | 61.0% | 60.9% |
| 20% to 50% | 62.7% | 65.0% | 64.8% | 64.6% | 62.8% | 66.1% | 69.2% | 117.0% | 64.4% | 63.9% |
| Over 50% | 61.2% | 63.3% | 63.6% | 64.2% | 63.0% | 66.8% | 68.3% | 98.1% | 63.0% | 61.7% |
| <i>Difference, High - Low</i> | <i>-4.3%</i> | <i>-1.8%</i> | <i>0.7%</i> | <i>2.8%</i> | <i>1.6%</i> | <i>2.2%</i> | <i>4.0%</i> | <i>25.4%</i> | <i>2%</i> | <i>0.8%</i> |
| Private Passenger Automobile Insurance, Liability, Preferred Driver, Coverage Limit 50,000 / 100,000 | | | | | | | | | | |
| Less than 20% | 69.5% | 65.9% | 64.6% | 67.6% | 67.2% | 70.7% | 72.1% | 70.2% | 67.0% | 62.7% |
| 20% to 50% | 72.0% | 72.6% | 65.7% | 66.3% | 69.7% | 70.5% | 78.5% | 75.9% | 79.7% | 67.9% |
| Over 50% | 68.5% | 66.4% | 66.3% | 67.8% | 63.9% | 70.6% | 79.3% | 73.4% | 68.7% | 66.8% |
| <i>Difference, High-Low</i> | <i>-1%</i> | <i>.5%</i> | <i>1.7%</i> | <i>.2%</i> | <i>-3.3%</i> | <i>-.1%</i> | <i>7.2%</i> | <i>3.2%</i> | <i>1.7%</i> | <i>4.1%</i> |

³ Figures for the year 2001 are anomalous due to large weather related losses.

Figure 1.3



2001 Homeowners loss ratio difference of 154% is not shown due to scaling.

Table 1.3: Private Passenger Automobile Insurance
Loss Ratio by % Minority

| % Minority | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|-------------------------------|---------|---------|---------|--------|--------|--------|--------|---------|-------|--------|
| Comprehensive | | | | | | | | | | |
| Less than 20% | 67.5% | 68.8% | 64.6% | 54.7% | 64.1% | 68.7% | 57.6% | 107.0% | 57.1% | 73.0% |
| 20% to 50% | 51.7% | 49.5% | 53.7% | 49.7% | 59.6% | 66.3% | 63.3% | 405.6% | 67.0% | 63.7% |
| Over 50% | 45.6% | 45.4% | 47.2% | 47.4% | 57.0% | 66.4% | 50.2% | 277.9% | 65.5% | 71.3% |
| <i>Difference, High - Low</i> | -21.90% | -23.40% | -17.40% | -7.30% | -7.10% | -2.30% | -7.40% | 170.90% | 8.40% | -1.70% |
| Collision | | | | | | | | | | |
| Less than 20% | 66.8% | 70.4% | 67.2% | 66.0% | 59.3% | 61.2% | 62.6% | 63.5% | 60.1% | 57.1% |
| 20% to 50% | 67.2% | 74.1% | 69.9% | 71.5% | 63.8% | 66.8% | 68.9% | 67.8% | 63.2% | 58.8% |
| Over 50% | 73.4% | 77.2% | 73.9% | 74.1% | 68.4% | 68.9% | 69.9% | 68.5% | 61.9% | 56.9% |
| <i>Difference, High - Low</i> | 6.60% | 6.80% | 6.70% | 8.10% | 9.10% | 7.70% | 7.30% | 5.00% | 1.80% | -0.20% |
| Liability | | | | | | | | | | |
| Less than 20% | 67.2% | 62.7% | 60.7% | 61.3% | 63.2% | 66.3% | 67.8% | 67.2% | 63.0% | 59.4% |
| 20% to 50% | 68.1% | 66.4% | 61.3% | 65.6% | 66.0% | 67.3% | 72.9% | 68.3% | 64.5% | 59.8% |
| Over 50% | 67.0% | 62.8% | 64.0% | 62.0% | 64.7% | 65.3% | 70.6% | 68.5% | 63.0% | 57.0% |
| <i>Difference, High - Low</i> | -0.20% | 0.10% | 3.30% | 0.70% | 1.50% | -1.00% | 2.80% | 1.30% | 0.00% | -2.40% |

**Table 1.4: Homeowners Insurance
Loss Ratio by % Minority**

| % Minority | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|--|---------------|----------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|----------------|
| Homeowners, Policy Forms 1, 2, 3, and 5 | | | | | | | | | | |
| Less than 20% | 72.3% | 87.1% | 74.3% | 49.5% | 58.4% | 60.6% | 60.5% | 130.8% | 78.2% | 82.4% |
| 20% to 50% | 56.1% | 60.2% | 77.6% | 58.4% | 66.3% | 63.8% | 70.3% | 514.8% | 114.2% | 44.7% |
| Over 50% | 66.7% | 69.1% | 83.2% | 57.0% | 65.6% | 75.7% | 77.0% | 317.5% | 88.4% | 39.6% |
| <i>Difference, High - Low</i> | <i>-5.60%</i> | <i>-18.00%</i> | <i>8.90%</i> | <i>7.50%</i> | <i>7.20%</i> | <i>15.10%</i> | <i>16.50%</i> | <i>186.70%</i> | <i>10.20%</i> | <i>-42.80%</i> |
| Renters and Condominium Units | | | | | | | | | | |
| Less than 20% | 46.9% | 47.9% | 46.1% | 41.5% | 36.3% | 36.5% | 41.2% | 42.1% | 43.3% | 35.7% |
| 20% to 50% | 47.2% | 42.7% | 56.1% | 47.9% | 41.6% | 42.7% | 53.4% | 49.9% | 44.9% | 44.1% |
| Over 50% | 72.0% | 53.1% | 73.0% | 60.2% | 67.7% | 53.0% | 54.2% | 70.4% | 61.3% | 43.6% |
| <i>Difference, High - Low</i> | <i>25.10%</i> | <i>5.20%</i> | <i>26.90%</i> | <i>18.70%</i> | <i>31.40%</i> | <i>16.50%</i> | <i>13.00%</i> | <i>28.30%</i> | <i>18.00%</i> | <i>7.90%</i> |
| Dwelling Fire | | | | | | | | | | |
| Less than 20% | 47.3% | 47.8% | 55.5% | 42.1% | 46.7% | 44.9% | 51.8% | 80.6% | 58.0% | 70.6% |
| 20% to 50% | 57.2% | 67.1% | 64.6% | 63.4% | 47.0% | 58.7% | 74.1% | 216.2% | 103.1% | 48.4% |
| Over 50% | 78.0% | 60.6% | 69.6% | 71.2% | 51.1% | 74.4% | 92.6% | 146.7% | 91.9% | 49.1% |
| <i>Difference, High - Low</i> | <i>30.70%</i> | <i>12.80%</i> | <i>14.10%</i> | <i>29.10%</i> | <i>4.40%</i> | <i>29.50%</i> | <i>40.80%</i> | <i>66.10%</i> | <i>33.90%</i> | <i>-21.50%</i> |
| Homeowners HO 8 Cash Value Policies | | | | | | | | | | |
| Less than 20% | 54.8% | 72.0% | 92.7% | 52.9% | 66.8% | 58.9% | 101.0% | 76.8% | 66.0% | 42.5% |
| 20% to 50% | 66.3% | 55.7% | 63.5% | 68.0% | 53.8% | 94.2% | 117.4% | 157.2% | 60.4% | 14.6% |
| Over 50% | 56.6% | 60.6% | 83.1% | 94.2% | 108.1% | 74.9% | 101.1% | 162.9% | 58.1% | 29.0% |
| <i>Difference, High - Low</i> | <i>1.80%</i> | <i>-11.40%</i> | <i>-9.60%</i> | <i>41.30%</i> | <i>41.30%</i> | <i>16.00%</i> | <i>0.10%</i> | <i>86.10%</i> | <i>-7.90%</i> | <i>-13.50%</i> |
| FAIR Plan Policies | | | | | | | | | | |
| Less than 20% | 66.2% | 76.4% | 87.6% | 101.4% | 55.6% | 59.5% | 80.8% | 74.3% | 54.1% | 59.7% |
| 20% to 50% | 97.3% | 93.4% | 41.6% | 201.5% | 79.3% | 53.8% | 64.8% | 115.7% | 42.2% | 63.6% |
| Over 50% | 110.0% | 92.3% | 103.5% | 108.8% | 78.7% | 70.3% | 77.2% | 119.1% | 82.6% | 70.1% |
| <i>Difference, High - Low</i> | <i>43.80%</i> | <i>15.90%</i> | <i>15.90%</i> | <i>7.40%</i> | <i>23.10%</i> | <i>10.80%</i> | <i>-3.60%</i> | <i>44.80%</i> | <i>28.50%</i> | <i>10.40%</i> |

II. Market Penetration

The following tables provide an estimate of the number of occupied homes and renters units that are insured with policies obtained in the commercial market. Homeowners exposures are matched with 2000 census data for each Zip code, where the census data provide counts of occupied structures containing 1 to 2 living units (and thus are considered personal rather than commercial coverage). Exposure data exclude Missouri mutual and surplus lines companies. Units lacking regular homeowners coverage either obtained policies from Missouri mutuals or unlicensed surplus lines carriers, or they went uninsured.

Table 2.1 documents an increasing coverage gap between high and low-minority residences. In 1997 a greater percentage of dwellings were insured in high-minority areas. This gap was reversed by 1999, and in 2003, 81 percent of dwellings were insured in high-minority areas, compared to 92 percent in low-minority areas. The disparity is unquestionably *larger* than shown because the insurance data excludes Missouri county mutuals, which tend to write almost exclusively in rural, predominantly white areas of the state.⁴

Table. 2.1: Homeowners, % of Occupied Dwellings

Insured by % Minority

(Dwellings 1-2 units, excluding mobile homes)

(Coverage excludes renters insurance, mobile homes)

| % Minority | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|-------------------------------|--------------|--------------|---------------|---------------|---------------|----------------|----------------|
| Less than 20% | 83.0% | 83.6% | 86.0% | 87.8% | 89.2% | 90.3% | 92.0% |
| 20% to 50% | 90.0% | 88.1% | 88.4% | 89.0% | 88.9% | 88.5% | 88.8% |
| Over 50% | 89.4% | 84.2% | 81.9% | 83.0% | 81.7% | 80.1% | 80.7% |
| <i>Difference, High - Low</i> | <i>6.40%</i> | <i>0.60%</i> | <i>-4.10%</i> | <i>-4.80%</i> | <i>-7.50%</i> | <i>-10.20%</i> | <i>-11.30%</i> |

A much more significant gap exists in renters insurance coverage between high- and low-minority areas, with renters located in areas with high concentrations of minorities insured at about one-third the rate of renters located in Zip codes with few minorities.

⁴ County mutuals do not report data by ZIP code and cannot be directly analyzed.

Table 2.2: Renters Insurance, % of Renters w/ Coverage, by % Minority

| % Minority | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|-------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Less than 20% | 30.4% | 30.7% | 31.6% | 31.8% | 33.3% | 33.5% | 33.1% |
| 20% to 50% | 23.4% | 23.3% | 23.9% | 23.9% | 24.8% | 24.5% | 22.8% |
| Over 50% | 11.5% | 12.1% | 12.4% | 12.9% | 13.7% | 13.1% | 12.5% |
| <i>Difference, High - Low</i> | <i>-18.90%</i> | <i>-18.60%</i> | <i>-19.20%</i> | <i>-18.90%</i> | <i>-19.60%</i> | <i>-20.40%</i> | <i>-20.60%</i> |

Market penetration is significantly related to Zip code median household incomes. Zip codes falling into the lowest income quartile for Missouri had a market penetration rate of 74 percent, compared to full market saturation in the wealthiest fourth of Zip codes, where 100 percent of owner-occupied dwellings had insurance coverage.

Table 2.3: Homeowners, % of Occupied Dwellings Insured by Median Household Income (Quartiles)

(Dwellings 1-2 units, excluding mobile homes)

(Coverage excludes renters insurance)

| Income Quartile | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|-------------------------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Lowest | 79.6% | 76.8% | 75.7% | 76.1% | 76.2% | 74.3% | 73.5% |
| Second | 79.0% | 78.5% | 79.4% | 80.5% | 80.8% | 80.2% | 79.8% |
| Third | 81.4% | 81.7% | 82.9% | 84.5% | 85.1% | 85.2% | 85.6% |
| Highest | 88.3% | 88.9% | 92.0% | 94.0% | 96.3% | 98.4% | 100.0% |
| <i>Difference, High - Low</i> | <i>8.70%</i> | <i>12.10%</i> | <i>16.30%</i> | <i>17.90%</i> | <i>20.10%</i> | <i>24.10%</i> | <i>26.50%</i> |

Table 2.4 depicts coverage rates by income quartile and percent minority. After “controlling” for income levels, minority density does not appear to account for additional disparities in coverage levels. For the two lowest income quartiles, Zip codes with high-minority concentrations had higher levels of coverage than did those with fewer minorities, although a gap remains for the highest income level.

**Table 2.4: Homeowners, % of Occupied Dwellings
Insured by Median Household Income (Quartiles) and % Minority**
(Dwellings 1-2 units, excluding mobile homes)
(Coverage excludes renters insurance)

| % Minority | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|--------------------------------|---------------|--------------|---------------|---------------|---------------|---------------|---------------|
| Lowest Income Quartile | | | | | | | |
| Less than 20% | 72.4% | 72.5% | 73.4% | 73.4% | 74.1% | 73.5% | 71.2% |
| 20% to 50% | 84.6% | 82.3% | 81.2% | 81.5% | 82.1% | 81.0% | 79.6% |
| Over 50% | 89.4% | 81.8% | 77.8% | 78.6% | 77.6% | 74.6% | 75.2% |
| <i>Difference, High - Low</i> | <i>17.00%</i> | <i>9.30%</i> | <i>4.40%</i> | <i>5.20%</i> | <i>3.50%</i> | <i>1.10%</i> | <i>4.00%</i> |
| Second Income Quartile | | | | | | | |
| Less than 20% | 76.7% | 76.9% | 78.2% | 79.2% | 79.7% | 79.0% | 78.6% |
| 20% to 50% | 92.3% | 89.1% | 89.3% | 90.5% | 90.6% | 90.0% | 90.1% |
| Over 50% | 86.8% | 82.7% | 81.5% | 82.5% | 82.1% | 80.9% | 81.5% |
| <i>Difference, High - Low</i> | <i>10.10%</i> | <i>5.80%</i> | <i>3.30%</i> | <i>3.30%</i> | <i>2.40%</i> | <i>1.90%</i> | <i>2.90%</i> |
| Third Income Quartile | | | | | | | |
| Less than 20% | 80.7% | 81.3% | 82.8% | 84.6% | 85.4% | 85.5% | 86.1% |
| 20% to 50% | 82.6% | 81.4% | 81.3% | 82.0% | 81.4% | 80.7% | 80.8% |
| Over 50% | 90.7% | 88.9% | 87.5% | 88.4% | 86.9% | 85.7% | 85.9% |
| <i>Difference, High - Low</i> | <i>10.00%</i> | <i>7.60%</i> | <i>4.70%</i> | <i>3.80%</i> | <i>1.50%</i> | <i>0.20%</i> | <i>-0.20%</i> |
| Highest Income Quartile | | | | | | | |
| Less than 20% | 87.7% | 88.6% | 91.9% | 94.1% | 96.6% | 98.6% | 100% |
| 20% to 50% | 93.9% | 92.4% | 93.2% | 93.5% | 93.8% | 93.4% | 94.2% |
| Over 50% | 94.1% | 90.7% | 91.2% | 93.7% | 92.7% | 91.9% | 92.8% |
| <i>Difference, High - Low</i> | <i>6.40%</i> | <i>2.10%</i> | <i>-0.70%</i> | <i>-0.40%</i> | <i>-3.90%</i> | <i>-6.70%</i> | <i>-7.20%</i> |

The regression model introduced at the beginning of this work controls for a host of socioeconomic variables that can be expected to impact coverage levels. By statistically controlling for these other variables, the independent and discrete impact of the racial composition of an area on homeowners coverage rates can be estimated. The model is estimated for both homeowners and renters coverages. The results indicate that the level of minority concentration in a Zip code is correlated with coverage levels, irrespective of socioeconomic status, other factors that impact availability **and** the price of coverage. Each 1 percent increase in minority density corresponds to a 0.1 percent decrease in the rate of dwellings that possess insurance coverage obtained in the commercial market.

Racial composition was not statistically significant for renters insurance, which was more strongly correlated with median household income and other socioeconomic indicators.

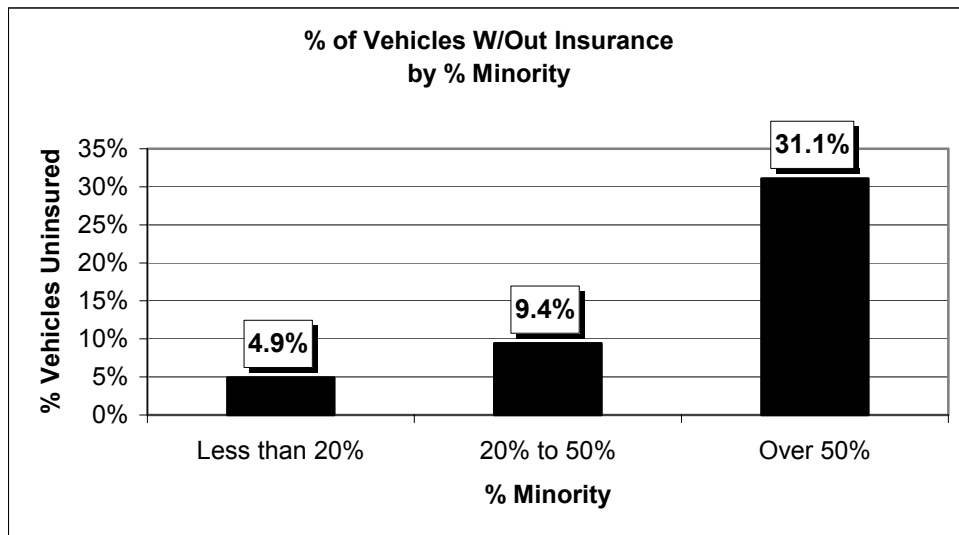
**Table 2.5: Weighted OLS Stepwise Regression
Homeowners, % of Occupied Dwellings Insured
% Renters W/ Rental Coverage**

| Variable | Homeowners Coverage | | Renters Coverage | |
|--|---------------------|---------|--------------------|---------|
| | Parameter Estimate | P-Value | Parameter Estimate | P-Value |
| Intercept | 34.1 | .0131 | -.5466 | .0001 |
| % Minority | -.1011 | .0325 | D | D |
| Average Premium* | -.0600 | .0001 | D | D |
| Unemployment Rate | .833 | .0004 | D | D |
| % Urban | .1273 | .0001 | .2060 | .0001 |
| % Households without Vehicle | -.3082 | .0547 | -.9115 | .0001 |
| % Households without Telephone | -1.7475 | .0001 | D | D |
| % Housing Units Vacant | .941 | .0001 | 1.665 | .0001 |
| % Housing Units Rented | -.3315 | .0001 | D | D |
| Median Household Income | .000286 | .0001 | .0000165 | .0001 |
| Median Age of Housing Units (Year Built) | .0375 | .0001 | D | D |
| % Pop Below Poverty Level | D | D | D | D |
| <i>R-Squared</i> | <i>.4733</i> | | <i>.5217</i> | |

**Average premium is calculated for standard homeowners policy (HO 1, 2, 3, or 5) providing between \$70,000 and \$99,999 of coverage, and renters coverage, less than \$69,999 of coverage.
2002 Data*

The disparity in the percent of vehicles that lack liability insurance between high and low-minority areas is much more striking than that observed for homeowners insurance. In 1999 (the latest available data year for registered vehicles), fully 31 percent of registered vehicles in high-minority areas lacked mandatory liability coverage, compared to only 4.9 percent of vehicles in low-minority Zip codes (Figure 2.1). A similar gap exists between areas falling into the lowest median household income quartile compared to the highest, with uninsured levels of 15.9 percent and 5.4 percent respectively (Figure 2.2).

**Figure 2.1: % of Registered Vehicles Lacking Liability Coverage, 1999
by % Minority**



**Figure 2.2: % of Registered Vehicles Lacking Liability Coverage, 1999
by Income Quartile**

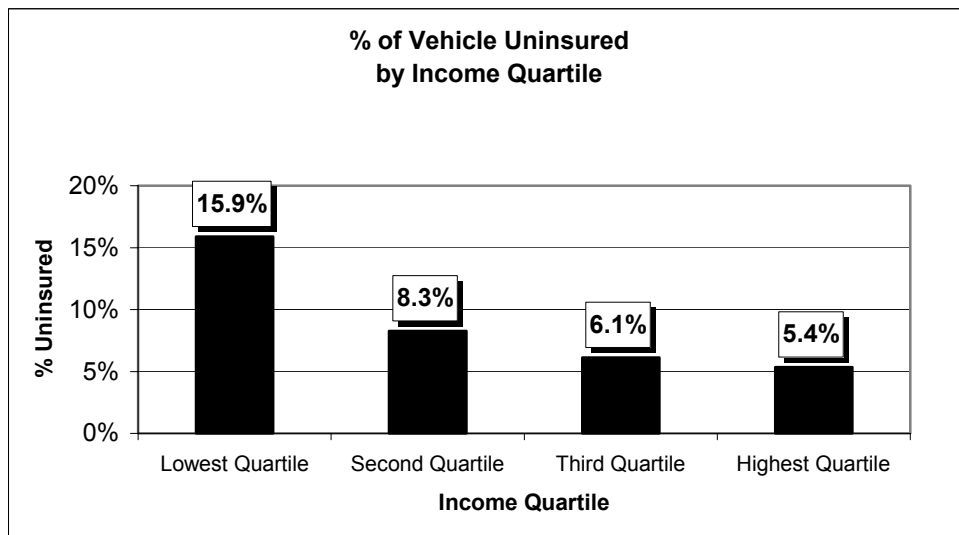
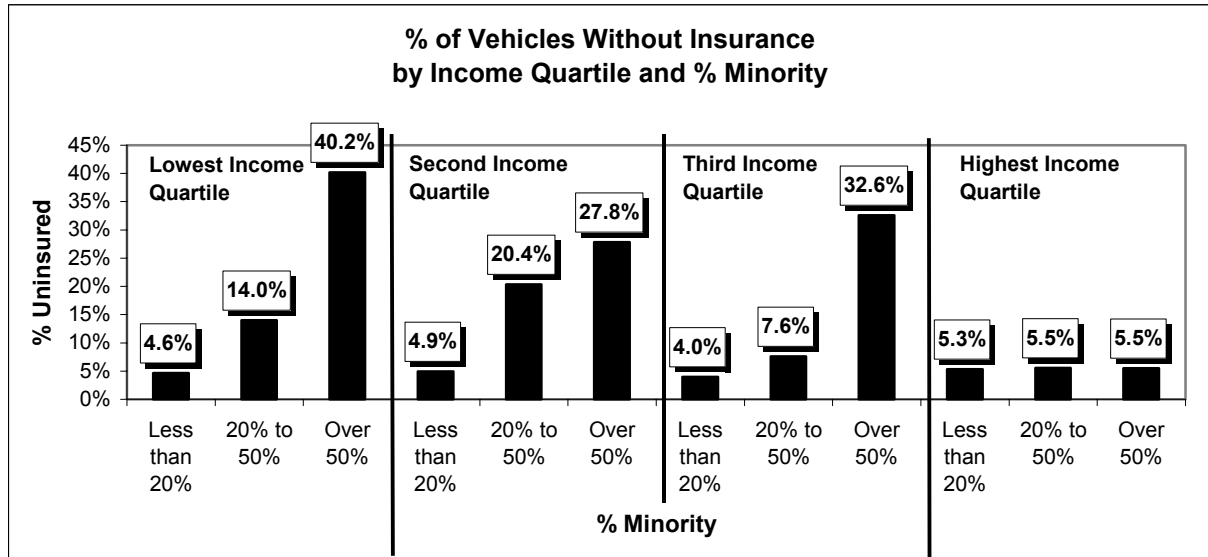


Figure 2.3 depicts the rate of uninsured vehicles by minority density, across different household income quartiles. A significant gap exists between minority levels for all income quartiles save the highest.

**Figure 2.3: % of Registered Vehicles Lacking Liability Coverage, 1999
by % Minority and Income Quartile**



The results of the regression analysis displayed in Table 2.6 indicate that, like homeowners coverage, the relationship between minority concentration in a Zip code and the percent of vehicles without liability coverage remains after controlling for socioeconomic variables and average premiums charged for coverage.

Table 2.6: Weighted OLS Stepwise Regression: % of Registered Vehicles Uninsured

| Variable | Parameter Estimate | P-Value |
|----------------------------|--------------------|---------|
| Intercept | -11.55 | .0001 |
| % Minority | .0583 | .0010 |
| Average Premium | .2199 | .0001 |
| Unemployment Rate | .4978 | .0001 |
| % Urban | .0318 | .0001 |
| % Households w/out Vehicle | .8557 | .0001 |
| Median Household Income | .00006423 | .0001 |
| <i>R-Squared</i> | .6057 | |

III. Agent Presence

The presence of agents in a given locale can be a useful indicator of how actively insurers market in an area, as well as the level of service quality that policy-holders might expect from insurers.

Relatively few agents licensed to write personal lines insurance are located in high-minority and poorer communities (Figure 3.1). Zip codes with the highest percentages of minorities had about one-half of the agents per capita than ZIP codes with the lowest concentrations of minorities. Similarly, agents are underrepresented in poorer communities as compared to the wealthiest communities.

Table 3.1: Personal Lines Insurance Agents Per Capita, 2003

| | Agents | Population, 2000 Census | Agents per 10,000 Residents |
|---|--------|----------------------------|-----------------------------------|
| Agents Per Capita by % Minority | | | |
| Less than 20% | 11,762 | 4,537,819 | 25.9 |
| 20% to 50% | 1,377 | 515,514 | 26.7 |
| Over 50% | 785 | 541,878 | 14.5 |
| Agents Per Capita by Median Household Income (Quartiles) | | | |
| Lowest Quartile | 778 | 670,987 | 13.4 |
| Second Quartile | 2184 | 1,129,933 | 20.9 |
| Third Quartile | 2607 | 1,120,392 | 23.2 |
| Highest Quartile | 7,222 | 2,673,899 | 30.2 |

Significant disparities in agent presence remain among communities characterized by similar household incomes but differing with respect to racial composition (Figure 3.2). The regression analysis presented in Table 3.2 more rigorously and fully controls for the market effects of socioeconomic status. As estimated by this model, a 2 percent increase in minority density is associated with a decline of one agent per 10,000 residents, irrespective of socioeconomic characteristics of communities.

Figure 3.1 Personal Lines Insurance Agents Per Capita by Median Household Income and Minority Concentration

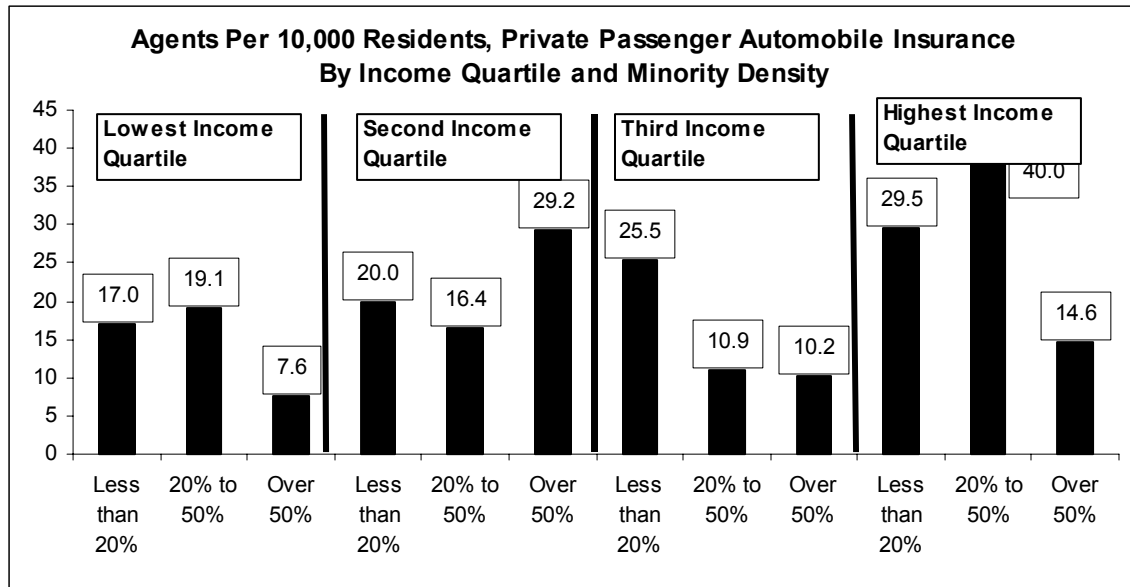


Table 3.2: Weighted OLS Stepwise Regression: Personal Lines Agents Per 10,000 Residents

| Variable | Parameter Estimate | p-value (significance level) |
|--|--------------------|------------------------------|
| Intercept | -22.38 | .0009 |
| % Minority | -.240 | .0001 |
| Median Value Owner Occupied Homes (by \$10,000 Increments) | .8597 | .0001 |
| % Rental Households | .716 | .0001 |

Model R-Squared Value: .168

Variables removed for lack of significance:

- % Urban population
- % Population below poverty level
- % Residences vacant at time of census
- Median household Income
- % w/ college education

IV: Insurance Availability: Residual Markets

Residual markets, or “markets of last resort,” are state-established, industry-operated insurance pools designed to provide coverage for individuals who are unable to obtain insurance in the commercial market. For homeowners insurance, the Fair Access to Insurance Requirements (FAIR) Plan offers a basic dwelling fire policy with a maximum of \$100,000 of total coverage, excluding various perils. The Missouri Joint Underwriting Association (JUA) provides automobile insurance coverage for individuals who cannot find insurance in the private market. The market share of residual markets provides a good indicator of the overall health and competitiveness of the commercial market.

Neither FAIR Plan nor JUA policies constitute a significant proportion of personal lines business in Missouri, and market shares have declined significantly since 1990. However, residual market shares are considerably higher in high-minority areas compared to low-minority areas. As a percentage of all homeowners policies in force in 2003, FAIR Plan policies were more than 14 times more prevalent in high-minority areas compared to low-minority areas. A considerable gap also exists for JUA auto policies: .03 percent of policies sold in high-minority areas were issued by the JUA, compared to less than .01 percent in low-minority areas. The gap remains even among areas of similar income levels (Table 4.2).

**Table 4.1: Residual Market by % Minority
Homeowners and Automobile Insurance**

| % Minority | 1990 | 1995 | 2000 | 2003 | 1990 | 1995 | 2000 | 2003 |
|--|-------------|-------------|-------------|-------------|--|-------------|-------------|-------------|
| Homeowners Residual Market (FAIR Plan) | | | | | | | | |
| Market Share Based on Written Premium | | | | | Market Share Based on Exposures | | | |
| Less than 20% | 0.76% | 0.30% | 0.20% | .14% | 0.92% | 0.92% | 0.26% | .24% |
| 20% to 50% | 0.84% | 0.41% | 0.41% | .40% | 0.07% | 1.07% | 0.59% | .71% |
| Over 50% | 4.03% | 1.93% | 1.81% | 1.49% | 5.77% | 5.77% | 3.16% | 3.40% |
| Private Passenger Automobile Residual Market (JUA) Liability Coverage | | | | | | | | |
| Market Share Based on Written Premium | | | | | Market Share Based on Exposures | | | |
| Less than 20% | 0.41% | 0.33% | 0.03% | .02% | 0.14% | 0.11% | 0.01% | .01% |
| 20% to 50% | 0.46% | 0.33% | 0.02% | .02% | 0.18% | 0.13% | 0.02% | .01% |
| Over 50% | 1.00% | 0.85% | 0.13% | .06% | 0.49% | 0.37% | 0.06% | .03% |

**Table 4.2: Residual Market Share by % Minority and Income Quartile
Homeowners and Automobile Insurance**

| Homeowners Residual Market (FAIR Plan) | | | | | | | | |
|---|-------|-------|-------|---------------------------------|---------------------------------|--------|-------|-------|
| % Minority | 1990 | 2000 | 2003 | Market Share Based on Exposures | | | | |
| | | | | 1990 | 1995 | 2000 | | |
| Lowest Income Quartile | | | | | | | | |
| Less than 20% | 4.49% | 2.06% | 1.33% | 0.89% | 4.65% | 4.65% | 1.41% | 1.24% |
| 20% to 50% | 5.18% | 2.26% | 2.37% | 1.64% | 6.85% | 6.85% | 3.37% | 3.03% |
| Over 50% | 7.48% | 3.53% | 3.35% | 2.48% | 10.63% | 10.63% | 5.82% | 5.76% |
| Second Income Quartile | | | | | | | | |
| Less than 20% | 1.90% | 0.70% | 0.52% | 0.37% | 2.11% | 2.11% | 0.61% | 0.58% |
| 20% to 50% | 0.75% | 0.42% | 0.37% | 0.41% | 0.81% | 0.81% | 0.48% | 0.66% |
| Over 50% | 2.01% | 1.10% | 1.05% | 1.10% | 2.61% | 2.61% | 1.73% | 2.27% |
| Third Income Quartile | | | | | | | | |
| Less than 20% | 0.59% | 0.27% | 0.18% | 0.15% | 0.68% | 0.68% | 0.22% | 0.24% |
| 20% to 50% | 0.31% | 0.19% | 0.23% | 0.36% | 0.29% | 0.29% | 0.23% | 0.52% |
| Over 50% | 1.00% | 0.51% | 0.54% | 0.77% | 1.20% | 1.20% | 0.74% | 1.43% |
| Highest Income Quartile | | | | | | | | |
| Less than 20% | 0.21% | 0.09% | 0.07% | 0.05% | 0.26% | 0.26% | 0.08% | 0.09% |
| 20% to 50% | 0.24% | 0.16% | 0.16% | 0.22% | 0.25% | 0.25% | 0.18% | 0.33% |
| Over 50% | 0.42% | 0.24% | 0.27% | 0.37% | 0.56% | 0.56% | 0.34% | 0.62% |
| Private Passenger Automobile Residual Market (JUA) Liability Coverage | | | | | | | | |
| % Minority | 1990 | 1995 | 2000 | 2003 | Market Share Based on Exposures | | | |
| | | | | | 1990 | 1995 | 2000 | 2003 |
| Lowest Income Quartile | | | | | | | | |
| Less than 20% | 1.10% | 0.71% | 0.06% | 0.06% | 0.35% | 0.27% | 0.02% | 0.03% |
| 20% to 50% | 1.44% | 0.94% | 0.22% | 0.07% | 0.74% | 0.47% | 0.09% | 0.03% |
| Over 50% | 1.61% | 1.23% | 0.23% | 0.07% | 0.86% | 0.63% | 0.12% | 0.04% |
| Second Income Quartile | | | | | | | | |
| Less than 20% | 0.67% | 0.57% | 0.07% | 0.04% | 0.19% | 0.18% | 0.02% | 0.02% |
| 20% to 50% | 0.41% | 0.30% | 0.02% | 0.01% | 0.16% | 0.11% | 0.00% | 0.01% |
| Over 50% | 0.59% | 0.76% | 0.09% | 0.03% | 0.28% | 0.26% | 0.02% | 0.02% |
| Third Income Quartile | | | | | | | | |
| Less than 20% | 0.38% | 0.34% | 0.03% | 0.02% | 0.07% | 0.07% | 0.00% | 0.01% |
| 20% to 50% | 0.32% | 0.30% | 0.02% | 0.00% | 0.07% | 0.09% | 0.00% | 0.00% |
| Over 50% | 0.51% | 0.42% | 0.05% | 0.04% | 0.14% | 0.18% | 0.01% | 0.02% |
| Fourth Income Quartile | | | | | | | | |
| Less than 20% | 0.28% | 0.24% | 0.01% | 0.01% | 0.09% | 0.07% | 0.01% | 0.01% |
| 20% to 50% | 0.37% | 0.25% | 0.03% | 0.02% | 0.01% | 0.09% | 0.01% | 0.01% |
| Over 50% | 0.74% | 0.55% | 0.08% | 0.13% | 0.28% | 0.23% | 0.03% | 0.04% |

V: Policy Types and Risk Classifications

For automobile coverage, individuals representing higher levels of assessed risk are assigned to “standard” or “non-standard” classes rather than the “preferred” class and are surcharged. These risk classifications are less relevant today than they were 10 years ago. Many companies have adopted “tiered” classes that have supplanted the more traditional preferred, standard, and non-standard classes. MDI does not currently collect data for tiered classes, so any conclusions should be somewhat attenuated.

Tables 5.1-5.3 display the percent of all liability exposures assigned to either standard or non-standard risk classes (i.e., all exposures that are not preferred risk) by percent minority, median household income, and both minority density and income together. The percentage of insureds assigned to non-preferred risk classes increased during the mid-1990’s, though it has declined since then. Risk classes are also related to median household incomes, so that in 2003 a 6 percentage point difference existed between the wealthiest and poorest income quartiles. With respect to minority density, even Zip codes with similar income characteristics evince a gap in risk classes, so that high-minority populations are associated with a greater percentage of exposures classified as non-preferred risks. The regression model at the end of this section provides a more rigorous control for socioeconomic variables (see below).

**Table 5.1: Private Passenger Automobile Insurance
% Non-Preferred Liability Exposures by % Minority**

| % Minority | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|-------------|
| Less than 20% | 21.7% | 21.7% | 21.0% | 21.6% | 23.5% | 23.0% | 23.9% | 24.3% | 23.4% | 24.3% |
| 20% to 50% | 26.2% | 26.5% | 25.8% | 26.5% | 28.4% | 27.5% | 29.0% | 29.2% | 27.9% | 29.4% |
| Over 50% | 35.8% | 35.4% | 33.9% | 34.5% | 37.2% | 34.7% | 36.1% | 34.8% | 31.4% | 33.5% |
| <i>% Point Difference</i> | <i>14.1%</i> | <i>13.8%</i> | <i>12.9%</i> | <i>12.9%</i> | <i>13.7%</i> | <i>11.8%</i> | <i>12.2%</i> | <i>10.5%</i> | <i>8.0%</i> | <i>9.2%</i> |

**Table 5.2: Private Passenger Automobile Insurance
% Non-Preferred by Median Household Income (Quartile)**

| Income Quartile | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Lowest | 25.9% | 25.5% | 25.1% | 26.0% | 30.1% | 29.2% | 30.1% | 30.3% | 28.2% | 29.2% |
| Second | 23.1% | 23.4% | 22.9% | 23.8% | 26.7% | 26.2% | 27.0% | 27.4% | 26.5% | 27.7% |
| Third | 21.9% | 22.1% | 21.5% | 22.1% | 24.8% | 24.3% | 25.4% | 25.8% | 24.8% | 26.0% |
| Highest | 22.7% | 22.5% | 21.5% | 22.0% | 22.9% | 22.1% | 23.1% | 23.3% | 22.7% | 23.2% |
| <i>% Point Difference</i> | <i>3.3%</i> | <i>3.0%</i> | <i>3.6%</i> | <i>4.0%</i> | <i>7.2%</i> | <i>7.1%</i> | <i>7.0%</i> | <i>7.0%</i> | <i>5.5%</i> | <i>6.0%</i> |

**Table 5.3: Private Passenger Automobile Insurance
% Non-Preferred by Median Household Income and % Minority**

| % Minority | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|--------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|-------------|-------------|
| Lowest Income Quartile | | | | | | | | | | |
| Less than 20% | 21.9% | 21.8% | 21.8% | 22.6% | 26.6% | 26.2% | 26.7% | 27.1% | 25.6% | 26.5% |
| 20% to 50% | 24.7% | 24.9% | 25.3% | 27.0% | 33.4% | 33.2% | 35.0% | 34.8% | 36.0% | 36.7% |
| Over 50% | 38.5% | 37.7% | 35.9% | 36.6% | 39.9% | 37.4% | 39.3% | 36.3% | 33.8% | 35.6% |
| <i>% Point Difference</i> | <i>16.6%</i> | <i>15.9%</i> | <i>14.1%</i> | <i>14.0%</i> | <i>13.2%</i> | <i>11.2%</i> | <i>12.6%</i> | <i>9.3%</i> | <i>8.2%</i> | <i>9.1%</i> |
| Second Income Quartile | | | | | | | | | | |
| Less than 20% | 21.6% | 21.9% | 21.5% | 22.3% | 25.4% | 25.2% | 26.0% | 26.3% | 26.0% | 27.1% |
| 20% to 50% | 27.7% | 28.6% | 27.8% | 29.3% | 30.8% | 28.8% | 30.2% | 28.1% | 27.8% | 29.4% |
| Over 50% | 35.0% | 35.3% | 34.4% | 35.1% | 37.5% | 34.6% | 35.8% | 32.9% | 31.1% | 33.3% |
| <i>% Point Difference</i> | <i>13.5%</i> | <i>13.4%</i> | <i>12.9%</i> | <i>12.8%</i> | <i>12.1%</i> | <i>9.4%</i> | <i>9.8%</i> | <i>6.6%</i> | <i>5.1%</i> | <i>6.2%</i> |
| Third Income Quartile | | | | | | | | | | |
| Less than 20% | 20.4% | 20.7% | 20.3% | 21.0% | 23.6% | 23.3% | 24.3% | 24.5% | 24.0% | 25.0% |
| 20% to 50% | 29.0% | 29.2% | 27.8% | 28.5% | 31.0% | 30.1% | 32.3% | 32.0% | 31.0% | 33.4% |
| Over 50% | 33.7% | 33.3% | 32.1% | 32.6% | 36.1% | 33.3% | 34.3% | 31.6% | 30.3% | 33.1% |
| <i>% Point Difference</i> | <i>13.3%</i> | <i>12.5%</i> | <i>11.9%</i> | <i>11.6%</i> | <i>12.5%</i> | <i>10.0%</i> | <i>10.1%</i> | <i>7.1%</i> | <i>6.3%</i> | <i>8.1%</i> |
| Highest Income Quartile | | | | | | | | | | |
| Less than 20% | 22.2% | 22.0% | 21.0% | 21.5% | 22.4% | 21.7% | 22.6% | 22.7% | 21.9% | 22.8% |
| 20% to 50% | 25.0% | 25.2% | 24.6% | 24.9% | 25.9% | 25.1% | 26.2% | 26.0% | 25.2% | 26.5% |
| Over 50% | 33.3% | 33.4% | 31.1% | 31.2% | 32.5% | 30.9% | 31.4% | 30.2% | 28.4% | 30.1% |
| <i>% Point Difference</i> | <i>11.1%</i> | <i>11.4%</i> | <i>10.1%</i> | <i>9.7%</i> | <i>10.0%</i> | <i>9.2%</i> | <i>8.7%</i> | <i>7.5%</i> | <i>6.5%</i> | <i>7.3%</i> |

For homeowners coverages, high-minority area consumers are sold a disproportionate number of “limited benefit policies” that do not offer the coverage and benefits found in standard policies. The policy-type categories collected by the Missouri Department of Insurance are as follows:

Category A: Standard homeowners policies, HO Forms 1, 2, 3, or 5. These are basic policies on structure and contents, including coverages for fire, wind, theft, and liability.

Category B: Coverage of dwelling losses by fire, but lacking coverage for liability or theft without additional premium. Coverage of contents and perils other than fire are by endorsement only.

Category C: Cash value policies providing coverage to owner-occupants for a dwelling whose replacement costs greatly exceed its market value. Personal property, theft and additional coverages are more restrictive than other policy types.

Category D: Any dwelling fire policy subject to a surcharge based upon the physical condition of the property.

The following tables (Tables 5.4-5.6) display the percent of all homeowners coverages that are represented by the more restrictive policies (categories B-D) described above. The data displayed in Table 5.4 indicate a significant percentage point difference in the proportion of restrictive policies sold in high-minority areas compared to low-minority areas. Such policies accounted for 31.4 percent of exposures in high-minority areas in 2003, compared to 13.8 percent of policies in low-minority areas, a difference of 17.5 percentage points.

An even larger gap of 30.8 percent exists between the poorest and wealthiest communities (Table 5.5).

Table 5.6, displaying data by both income quartile and percent minority, does not reveal any unambiguous trends. Only the poorest Zip codes indicate any significant gap based on minority density. This may indicate that the prevalence of more restrictive policies in a community is related to other socioeconomic or market factors, which in turn are related to minority composition.

**Table 5.4: Homeowners Insurance
(Excluding Renters and Condominium)
% “Limited-Benefit” by % Minority**

| % Minority | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Less than 20% | 17.4% | 17.2% | 16.6% | 15.8% | 14.9% | 12.8% | 13.6% | 13.8% | 13.6% | 13.8% |
| 20% to 50% | 16.4% | 16.6% | 18.3% | 18.3% | 17.7% | 13.0% | 14.5% | 14.7% | 15.5% | 16.5% |
| Over 50% | 37.1% | 36.8% | 39.1% | 39.8% | 37.3% | 27.6% | 28.6% | 28.8% | 29.7% | 31.4% |
| <i>Difference</i> | 19.8% | 19.7% | 22.5% | 23.9% | 22.4% | 14.9% | 15.0% | 15.0% | 16.1% | 17.5% |

**Table 5.5: Homeowners Insurance
(Excluding Renters and Condominium)
% “Limited-Benefit” by Median Household Income (Quartiles)**

| Income Quartile | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Lowest | 49.8% | 49.4% | 49.7% | 48.6% | 46.3% | 38.7% | 37.4% | 37.7% | 38.3% | 39.0% |
| Second | 31.8% | 32.4% | 32.2% | 30.9% | 29.7% | 25.3% | 24.9% | 25.1% | 25.1% | 25.5% |
| Third | 20.3% | 20.4% | 20.2% | 19.9% | 19.1% | 16.0% | 16.8% | 17.1% | 17.0% | 17.5% |
| Highest | 8.1% | 7.8% | 7.9% | 7.7% | 6.9% | 5.4% | 7.2% | 7.4% | 7.6% | 8.2% |
| <i>Difference</i> | -41.7% | -41.6% | -41.8% | -40.9% | -39.4% | -33.2% | -30.2% | -30.3% | -30.7% | -30.8% |

**Table 5.6: Homeowners Insurance
(Excluding Renters and Condominium)
% of Limited-Benefit Policies by Median Household Income (Quartiles)
and % Minority**

| % Minority | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Lowest Income Quartile | | | | | | | | | | |
| Less than 20% | 43.3% | 42.9% | 40.8% | 38.3% | 37.2% | 33.6% | 31.7% | 32.4% | 32.5% | 32.2% |
| 20% to 50% | 47.3% | 47.8% | 50.8% | 49.3% | 47.5% | 41.1% | 39.9% | 40.2% | 41.4% | 42.7% |
| Over 50% | 57.4% | 56.9% | 59.1% | 59.7% | 56.7% | 44.3% | 43.8% | 43.6% | 44.9% | 46.4% |
| <i>Difference</i> | 14.1% | 13.9% | 18.3% | 21.4% | 19.6% | 10.7% | 12.0% | 11.2% | 12.4% | 14.3% |
| Second Income Quartile | | | | | | | | | | |
| Less than 20% | 33.7% | 34.2% | 33.0% | 30.9% | 29.8% | 27.0% | 26.2% | 26.3% | 26.2% | 26.3% |
| 20% to 50% | 23.1% | 24.6% | 28.1% | 29.1% | 28.4% | 17.4% | 18.3% | 18.0% | 18.6% | 19.7% |
| Over 50% | 27.7% | 28.1% | 30.9% | 31.6% | 29.9% | 20.4% | 22.0% | 22.5% | 23.4% | 25.1% |
| <i>Difference</i> | -6.0% | -6.1% | -2.1% | 0.7% | 0.1% | -6.5% | -4.2% | -3.8% | -2.8% | -1.2% |
| Third Income Quartile | | | | | | | | | | |
| Less than 20% | 22.2% | 22.3% | 21.6% | 21.1% | 20.1% | 17.2% | 17.7% | 18.1% | 17.6% | 18.0% |
| 20% to 50% | 10.2% | 10.4% | 11.9% | 12.5% | 12.2% | 8.6% | 10.8% | 11.3% | 12.4% | 13.5% |
| Over 50% | 14.0% | 14.3% | 16.5% | 16.8% | 16.3% | 11.3% | 13.4% | 13.6% | 15.0% | 16.9% |
| <i>Difference</i> | -8.2% | -8.0% | -5.1% | -4.2% | -3.9% | -5.9% | -4.3% | -4.5% | -2.6% | -1.1% |

| Highest Income Quartile | | | | | | | | | | |
|-------------------------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|
| Less than 20% | 7.8% | 7.5% | 7.6% | 7.3% | 6.5% | 5.2% | 6.9% | 7.1% | 7.3% | 7.8% |
| 20% to 50% | 9.8% | 9.5% | 10.0% | 9.8% | 9.4% | 7.0% | 8.9% | 9.2% | 9.9% | 11.0% |
| Over 50% | 11.8% | 11.4% | 12.8% | 13.1% | 12.1% | 8.5% | 12.0% | 12.4% | 13.3% | 14.8% |
| <i>Difference</i> | 4.0% | 3.9% | 5.2% | 5.8% | 5.6% | 3.3% | 5.1% | 5.3% | 6.0% | 7.0% |

Table 5.7a displays the bivariate relationship (i.e. not controlling for other factors) between minority concentration, automobile risk class, and homeowners policy type. For both homeowners and automobile insurance, residents of high-minority neighborhoods are statistically more likely to be placed in a non-preferred risk class and to purchase more restrictive homeowners coverage.

Table 5.7b measures the same association between minority concentration and risk and policy types, but removes or “controls” for the effects of additional demographic and market factors. The estimated regression parameters displayed in Table 5.7b show that auto risk classification is significantly correlated with minority concentration, irrespective of socioeconomic status and other variables related to risk. Controlling for income, education levels, urbanization and other indicators, the percent of policies that are assigned non-preferred status increases by an average of .10 percent for each one percent increase in minority density. As suggested by the income/minority table above (Table 5.6), the presence of more restrictive homeowners policies does not appear to be statistically related to minority concentration, *when controlling for the other variables included in the model*.

Table 5.7a: Linear Regression, % Minority, Auto Risk Class, and Homeowners Policy Types, 2003

| Variable | Auto | | Home | |
|-----------------|-----------------------|---------|-----------------------|---------|
| | Estimated Coefficient | P-Value | Estimated Coefficient | P-Value |
| Intercept | .2367 | .0001 | 13.5 | .0001 |
| % Minority | .1438 | .0001 | .2493 | .0001 |
| <i>R-Square</i> | .2515 | | .1932 | |

Table 5.7b: OLS Stepwise Regression
Auto Risk Categories (% Non-Preferred Driver)
Homeowners Policy Type (% Policies With Limited Coverage)
2003

| Variable | Private Auto | | Homeowners | |
|-----------------------------------|-----------------------|---------|-----------------------|---------|
| | Estimated Coefficient | P-Value | Estimated Coefficient | P-Value |
| Intercept | 15.1 | .0001 | -27.06 | .0001 |
| % Minority | .1003 | .0001 | D | D |
| Median Household Income | .00000095 | .0007 | D | D |
| Unemployment Rate | .1730 | .0082 | D | D |
| % Adult Pop W/ Some College | -.0938 | .0001 | -.0526 | .0327 |
| % Urban | D | D | -.021 | .0047 |
| % Vehicles | -.4417 | .0001 | .1736 | .0008 |
| % Property Vacant | D | D | D | D |
| % Renters | D | D | .1512 | .0001 |
| Median Value Owner Occupied Homes | .00000012 | .0687 | .0170 | .0001 |
| Pop Below Poverty Level | .1023 | .0292 | .7735 | .0001 |
| % Households w/out Telephone | .6778 | .0001 | .8594 | .0001 |
| <i>R-Squared</i> | <i>.5530</i> | | <i>.8051</i> | |

VI: Market Share

The largest personal lines writers in Missouri do not possess a presence in high-minority areas commensurate with their market share in the state. The **combined** market share of the top 10 homeowners writers is 9.9 percent less in high-minority areas compared to low-minority areas; for automobile insurance the difference is 11.7 percent.⁵ Disparities are also apparent when market share is compared for the top 20 and the top 30 writers (Table 6.1). Similar market share trends are evident across median income levels (Table 6.2). Among Zip codes falling into the lowest income quartile for Missouri, the gap in market share of the largest 10 Missouri writers between high and low-minority areas was a very substantial 16.7 percent for homeowners coverage, and 15 percent for automobile coverage (Table 6.3).

Such disparities suggest that underwriting or rating practices adopted by the largest insurers have a disproportionate impact on high-minority and poorer communities. Consumers in these areas do not fully benefit from economies of scale of the state's largest insurers, possibly impacting premium levels or the ability to obtain coverage at all.

Table 6.1: Market Share by % Minority, Largest Missouri Writers

| | Private Passenger Automobile Insurance | | | | Homeowners Insurance | | | |
|-----------------------|--|-------|-------|-------|----------------------|-------|-------|-------|
| % Minority | 1990 | 2001 | 2002 | 2003 | 1990 | 2001 | 2002 | 2003 |
| Top 10 Writers | | | | | | | | |
| Less than 20% | 71.0% | 66.4% | 66.7% | 67.4% | 63.7% | 73.5% | 73.1% | 73.1% |
| 20% to 50% | 66.8% | 60.8% | 61.0% | 61.5% | 59.7% | 73.2% | 73.2% | 72.8% |
| Over 50% | 62.3% | 55.1% | 55.6% | 55.7% | 44.4% | 60.9% | 62.9% | 63.2% |
| % Point Difference | 8.7% | 11.3% | 11.1% | 11.7% | 19.3% | 12.6% | 10.2% | 9.9% |
| Top 20 Writers | | | | | | | | |
| Less than 20% | 81.4% | 77.8% | 78.7% | 79.6% | 73.7% | 83.8% | 83.4% | 83.9% |
| 20% to 50% | 78.8% | 74.5% | 76.2% | 77.3% | 70.2% | 83.0% | 82.3% | 82.9% |
| Over 50% | 73.3% | 69.6% | 71.8% | 72.9% | 61.2% | 71.4% | 72.7% | 73.8% |
| % Point Difference | 8.1% | 8.2% | 6.9% | 6.7% | 12.5% | 12.4% | 10.7% | 10.1% |
| Top 30 Writers | | | | | | | | |
| Less than 20% | 86.3% | 84.3% | 84.6% | 85.4% | 81.3% | 88.9% | 89.0% | 89.8% |
| 20% to 50% | 83.8% | 82.6% | 82.9% | 83.2% | 80.0% | 88.4% | 87.6% | 88.8% |
| Over 50% | 78.8% | 76.9% | 77.5% | 78.5% | 70.7% | 83.5% | 82.1% | 81.1% |
| % Point Difference | 7.5% | 7.4% | 7.1% | 6.9% | 10.6% | 5.4% | 6.9% | 8.7% |

⁵ The **combined** market share does not necessarily imply that each of the top 10 writers has a similar market penetration gap between high and low minority areas.

**Table 6.2: Market Share by Median Household Income (Quartile)
Largest Missouri Writers**

| | Private Passenger Automobile Insurance | | | | Homeowners Insurance | | | |
|---------------------------|--|-------------|-------------|-------------|----------------------|-------------|-------------|-------------|
| Income Quartile | 1990 | 2001 | 2002 | 2003 | 1990 | 2001 | 2002 | 2003 |
| Top 10 Writers | | | | | | | | |
| Lowest | 68.3% | 60.3% | 61.3% | 62.9% | 45.1% | 63.7% | 65.5% | 66.2% |
| Second | 71.6% | 63.9% | 64.0% | 65.4% | 57.9% | 71.4% | 72.2% | 72.6% |
| Third | 72.1% | 54.7% | 65.8% | 66.6% | 62.7% | 73.9% | 73.7% | 73.8% |
| Highest | 68.7% | 66.0% | 66.4% | 66.7% | 64.6% | 73.4% | 72.7% | 72.5% |
| <i>% Point Difference</i> | <i>0.4%</i> | <i>5.7%</i> | <i>5.1%</i> | <i>3.8%</i> | <i>19.5%</i> | <i>9.7%</i> | <i>7.2%</i> | <i>6.3%</i> |
| Top 20 Writers | | | | | | | | |
| Lowest | 79.0% | 73.7% | 75.6% | 76.8% | 70.3% | 76.5% | 76.5% | 77.7% |
| Second | 81.5% | 75.9% | 76.5% | 78.0% | 73.7% | 84.4% | 84.0% | 84.9% |
| Third | 81.8% | 77.5% | 78.3% | 79.3% | 73.8% | 85.2% | 85.3% | 85.9% |
| Highest | 79.9% | 77.6% | 78.7% | 79.4% | 71.2% | 82.3% | 82.0% | 82.4% |
| <i>% Point Difference</i> | <i>0.9%</i> | <i>3.9%</i> | <i>3.1%</i> | <i>2.6%</i> | <i>1.0%</i> | <i>5.8%</i> | <i>5.5%</i> | <i>4.7%</i> |
| Top 30 Writers | | | | | | | | |
| Lowest | 84.4% | 82.9% | 83.2% | 84.5% | 76.6% | 86.0% | 85.4% | 81.8% |
| Second | 86.5% | 83.8% | 83.7% | 85.0% | 81.4% | 89.2% | 89.3% | 88.8% |
| Third | 86.7% | 84.5% | 84.7% | 85.4% | 81.6% | 89.7% | 89.9% | 90.5% |
| Highest | 84.7% | 83.5% | 84.0% | 84.5% | 79.8% | 88.0% | 87.9% | 89.5% |
| <i>% Point Difference</i> | <i>0.3%</i> | <i>0.6%</i> | <i>0.8%</i> | <i>0.0%</i> | <i>3.2%</i> | <i>2.1%</i> | <i>2.5%</i> | <i>7.7%</i> |

**Table 6.3: Market Share by Median Household Income (Quartile) and
% Minority
Largest Missouri Writers**

| | Private Passenger Automobile Insurance | | | | Homeowners Insurance | | | |
|-------------------------------|--|--------------|--------------|--------------|----------------------|--------------|--------------|--------------|
| % Minority | 1990 | 2001 | 2002 | 2003 | 1990 | 2001 | 2002 | 2003 |
| Lowest Income Quartile | | | | | | | | |
| Top 10 Writers | | | | | | | | |
| Less than 20% | 73.5% | 65.4% | 66.4% | 68.1% | 58.0% | 73.4% | 73.9% | 74.5% |
| 20% to 50% | 66.9% | 54.4% | 55.6% | 60.5% | 46.7% | 64.2% | 66.3% | 66.9% |
| Over 50% | 62.1% | 52.9% | 53.5% | 53.1% | 33.7% | 53.8% | 57.0% | 57.9% |
| <i>% Point Difference</i> | <i>11.5%</i> | <i>12.5%</i> | <i>12.9%</i> | <i>15.0%</i> | <i>24.3%</i> | <i>19.6%</i> | <i>16.9%</i> | <i>16.7%</i> |
| Top 20 Writers | | | | | | | | |
| Less than 20% | 83.9% | 77.4% | 78.6% | 79.8% | 82.3% | 87.8% | 86.3% | 87.4% |
| 20% to 50% | 79.2% | 69.7% | 71.8% | 74.9% | 74.8% | 77.4% | 75.3% | 76.3% |
| Over 50% | 72.8% | 68.2% | 71.0% | 71.6% | 58.9% | 64.8% | 66.9% | 68.4% |
| <i>% Point Difference</i> | <i>11.1%</i> | <i>9.3%</i> | <i>7.7%</i> | <i>8.2%</i> | <i>23.4%</i> | <i>23.0%</i> | <i>19.4%</i> | <i>19.0%</i> |

| | Private Passenger Automobile Insurance | | | | Homeowners Insurance | | | |
|-------------------------|--|-------|-------|-------|----------------------|-------|-------|-------|
| % Minority | 1990 | 2001 | 2002 | 2003 | 1990 | 2001 | 2002 | 2003 |
| Top 30 Writers | | | | | | | | |
| Less than 20% | 89.5% | 86.3% | 86.2% | 87.6% | 86.4% | 90.7% | 91.2% | 89.3% |
| 20% to 50% | 85.7% | 84.9% | 84.6% | 86.7% | 80.1% | 85.7% | 86.1% | 79.5% |
| Over 50% | 77.8% | 76.0% | 76.9% | 77.5% | 67.4% | 81.2% | 79.6% | 75.0% |
| % Point Difference | 11.7% | 10.3% | 9.3% | 10.1% | 19.0% | 9.5% | 11.6% | 14.2% |
| Second Income Quartile | | | | | | | | |
| Top 10 Writers | | | | | | | | |
| Less than 20% | 73.6% | 65.5% | 65.7% | 67.3% | 60.4% | 72.9% | 73.4% | 73.7% |
| 20% to 50% | 68.3% | 59.1% | 58.8% | 59.0% | 54.9% | 69.6% | 72.2% | 73.1% |
| Over 50% | 63.6% | 56.3% | 56.5% | 56.9% | 49.8% | 65.4% | 67.0% | 67.2% |
| % Point Difference | 10.0% | 9.2% | 9.2% | 10.4% | 10.6% | 7.5% | 6.4% | 6.5% |
| Top 20 Writers | | | | | | | | |
| Less than 20% | 83.2% | 76.9% | 77.1% | 78.6% | 78.0% | 86.9% | 86.1% | 87.0% |
| 20% to 50% | 79.4% | 71.2% | 76.4% | 77.3% | 65.4% | 80.2% | 80.2% | 81.3% |
| Over 50% | 74.7% | 70.6% | 72.3% | 73.8% | 61.8% | 75.6% | 76.8% | 77.7% |
| % Point Difference | 8.5% | 6.2% | 4.9% | 4.8% | 16.2% | 11.3% | 9.3% | 9.3% |
| Top 30 Writers | | | | | | | | |
| Less than 20% | 88.3% | 84.9% | 84.7% | 86.0% | 84.8% | 90.5% | 91.0% | 89.9% |
| 20% to 50% | 83.3% | 82.1% | 82.6% | 82.5% | 74.4% | 87.0% | 86.1% | 88.4% |
| Over 50% | 79.8% | 77.6% | 77.7% | 79.3% | 72.5% | 84.8% | 83.6% | 84.7% |
| % Point Difference | 8.5% | 7.3% | 7.0% | 6.8% | 12.3% | 5.7% | 7.5% | 5.2% |
| Third Income Quartile | | | | | | | | |
| Top 10 Writers | | | | | | | | |
| Less than 20% | 74.4% | 67.5% | 67.5% | 68.4% | 63.5% | 74.3% | 74.1% | 74.4% |
| 20% to 50% | 63.9% | 56.7% | 56.3% | 56.9% | 61.6% | 73.4% | 72.8% | 72.1% |
| Over 50% | 61.8% | 55.8% | 56.4% | 56.7% | 56.6% | 69.1% | 69.3% | 68.4% |
| % Point Difference | 12.6% | 11.7% | 11.1% | 11.7% | 7.0% | 5.3% | 4.8% | 6.0% |
| Top 20 Writers | | | | | | | | |
| Less than 20% | 83.2% | 78.6% | 79.2% | 80.2% | 75.0% | 85.9% | 86.0% | 86.7% |
| 20% to 50% | 77.8% | 72.8% | 74.8% | 75.6% | 71.4% | 83.7% | 83.8% | 83.3% |
| Over 50% | 73.6% | 69.5% | 71.5% | 72.4% | 65.8% | 79.3% | 79.6% | 80.0% |
| % Point Difference | 9.6% | 9.0% | 7.7% | 7.8% | 9.2% | 6.6% | 6.3% | 6.7% |
| Top 30 Writers | | | | | | | | |
| Less than 20% | 88.0% | 85.4% | 85.6% | 86.3% | 82.0% | 90.0% | 90.5% | 90.8% |
| 20% to 50% | 82.8% | 81.8% | 82.4% | 81.4% | 81.8% | 89.0% | 88.2% | 90.2% |
| Over 50% | 79.8% | 76.3% | 76.5% | 77.9% | 76.9% | 86.6% | 85.1% | 86.9% |
| % Point Difference | 8.1% | 9.1% | 9.1% | 8.4% | 5.1% | 3.4% | 5.4% | 3.9% |
| Highest Income Quartile | | | | | | | | |
| Top 10 Writers | | | | | | | | |
| Less than 20% | 69.0% | 66.4% | 66.7% | 67.0% | 65.0% | 73.4% | 72.7% | 72.5% |

| | Private Passenger Automobile Insurance | | | | Homeowners Insurance | | | |
|--------------------|--|-------|-------|-------|----------------------|-------|-------|-------|
| % Minority | 1990 | 2001 | 2002 | 2003 | 1990 | 2001 | 2002 | 2003 |
| 20% to 50% | 67.4% | 64.0% | 64.6% | 64.2% | 63.4% | 75.9% | 74.7% | 73.8% |
| Over 50% | 60.9% | 57.7% | 58.4% | 58.9% | 54.6% | 64.5% | 64.6% | 64.8% |
| % Point Difference | 8.1% | 8.7% | 8.4% | 8.1% | 10.4% | 8.9% | 8.1% | 7.8% |
| Top 20 Writers | | | | | | | | |
| Less than 20% | 80.2% | 77.9% | 78.9% | 79.6% | 71.6% | 82.3% | 82.0% | 82.4% |
| 20% to 50% | 79.0% | 76.0% | 77.4% | 78.4% | 70.7% | 84.5% | 83.6% | 84.2% |
| Over 50% | 74.5% | 71.3% | 73.5% | 75.0% | 62.5% | 74.7% | 73.9% | 74.2% |
| % Point Difference | 5.7% | 6.6% | 5.4% | 4.7% | 9.1% | 7.6% | 8.1% | 8.2% |
| Top 30 Writers | | | | | | | | |
| Less than 20% | 84.9% | 83.7% | 84.2% | 84.7% | 79.8% | 88.0% | 88.0% | 89.6% |
| 20% to 50% | 84.0% | 82.6% | 82.9% | 83.6% | 81.4% | 89.1% | 88.2% | 89.9% |
| Over 50% | 78.7% | 78.9% | 79.7% | 80.2% | 71.4% | 84.2% | 82.9% | 84.8% |
| % Point Difference | 6.2% | 4.7% | 4.4% | 4.5% | 8.4% | 3.8% | 5.1% | 4.8% |

The gap in market share diminishes significantly when comparing insurer groups rather than individual companies. While not examined directly, this fact indicates that a disproportionate share of individuals in high-minority areas are placed into higher-risk companies *within* the group.

Table 6.4: Market Share: Top 10 Auto and Home Insurer Groups, 2003

| % Minority | Homeowners | Auto |
|---------------|------------|-------|
| Less than 20% | 79.3% | 79.2% |
| 20% to 50% | 80.0% | 79.3% |
| Over 50% | 72.9% | 76.3% |

Market share disparities associated with the minority composition of Zip codes remain after controlling for numerous other variables that may be expected to impact market conditions, for both auto and homeowners insurance (Table 6.5).

**Table 6.5: Weighted Stepwise OLS Regression
Market Share, Top 10 Missouri Insurers, 2003**

| Variable | Private Auto | | Homeowners | |
|-----------------------------------|-----------------------|---------|-----------------------|---------|
| | Estimated Coefficient | P-Value | Estimated Coefficient | P-Value |
| Intercept | 84.40 | | 90.4151 | .0001 |
| % Minority | -.1185 | .0001 | -.09915 | .0001 |
| Median Household Income | .00007450 | .0473 | .00020926 | .0001 |
| Unemployment Rate | -.3994 | .0001 | -.3983 | .0001 |
| % Adult Pop W/ Some College | D | D | -.1068 | .0002 |
| % Urban | D | D | D | D |
| % of household lacking vehicles | .2922 | .0001 | -.1163 | .0554 |
| Median Value Owner Occupied Homes | -.00005251 | .0001 | -.000119 | .0001 |
| % Pop Below Poverty Level | D | D | D | D |
| % Households w/out Telephone | -.51046 | .0001 | -.6097 | .0001 |
| <i>R-Squared</i> | <i>.4862</i> | | <i>.4454</i> | |

VI. Consumer Complaints

Complaint rates provide a measure of consumer dissatisfaction with quality of service provided by insurers. Elevated complaint rates may indicate market conduct problems (with appropriate caveats, see Appendix C).

Tables 7.1 and 7.2 display complaint indices “normed” to a statewide average of 100. Indices higher than 100 indicate a complaint rate exceeding the statewide average. An index of 200 would indicate a complaint rate twice the statewide average. Complaints are pooled across five years (1999 to 2003) to ensure a statistically valid sample.

From 1999 to 2003, consumers residing in high-minority areas complained about personal lines insurers at well over twice the rate of consumers residing in low-minority areas. Complaint rates were 2.2 times greater in high-minority areas for homeowners insurance (176 / 80); and 2.8 times greater for automobile insurance (233 / 82).

**Table 7.1: Homeowners Complaint Index by % Minority
(Average = 100)
1999-2003**

| % Minority | Population, 2000 Census | Complaints, 1999-2003 | Complaint Index Based on Premium Volume | Complaint Index Based on Exposures |
|---------------|----------------------------|--------------------------|--|--|
| Less than 20% | 4,535,553 | 2,496 | 80 | 80 |
| 20% to 50% | 515,514 | 655 | 193 | 183 |
| Over 50% | 541,859 | 518 | 170 | 176 |

**Table 7.2: Private Passenger Auto Complaint Index by % Minority
(Average=100)
1999-2003**

| % Minority | Population, 2000 Census | Complaints, 1999-2003 | Complaint Index Based on Premium Volume | Complaint Index Based on Exposures |
|---------------|----------------------------|--------------------------|--|---|
| Less than 20% | 4,535,553 | 5,76 | 86 | 83 |
| 20% to 50% | 515,514 | 775 | 122 | 137 |
| Over 50% | 541,859 | 810 | 167 | 233 |

Additional detail is provided in Tables 7.3 and 7.4.

By far the most prevalent of complaints were those associated with claims handling, such as claim denials or payment delays. Additional reasons were related to underwriting (such as refusals to insure), policyholder service (timely communications, billing, etc), and marketing (misleading sales practices, for instance). Complaint rates are presented for all complaints, as well as for those complaints in which consumers obtained a concession from an insurer as a result of the complaint. For both categories of complaints (“all complaints,” and “complaints with concession”), and for each of the four complaint reasons, complaint rates are strongly associated with minority density.

**Table 7.3: Private Passenger Automobile Insurance
Complaint Rates Per 10,000 Exposures (1999-2003) by Complaint Reason**

| All complaints, regardless of resolution | | | | |
|--|---------------|-------------|-------------|---|
| Percent minority / Complaint reason | Less than 20% | 20% to 50% | Over 50% | Complaint rate ratio (high to low Minority) |
| Claims | .95 | 1.54 | 2.55 | 2.68 |
| Underwriting | .14 | .28 | .39 | 2.79 |
| Policyholder service | .16 | .27 | .55 | 3.44 |
| Marketing | .02 | .04 | .12 | 6.00 |
| All Complaints | 1.28 | 2.12 | 3.60 | 2.81 |

| Complaints resulting in a concession to complainant | | | | |
|---|---------------|------------|-------------|---|
| Percent minority / Complaint reason | Less than 20% | 20% to 50% | Over 50% | Complaint rate ratio (high to low Minority) |
| Claims | .32 | .51 | .79 | 2.47 |
| Underwriting | .04 | .08 | .09 | 2.25 |
| Policyholder service | .06 | .11 | .19 | 3.17 |
| Marketing | .01 | .02 | .08 | 8.00 |
| All Complaints | .43 | .73 | 1.16 | 2.70 |

**Table 7.4: Homeowners Insurance
Complaints Per 10,000 Exposures (1999-2003), By Complaint Reason
Bracketed Complaint Rates [] Indicate Complaints Resulting in a
Concession by the Insurer**

| All complaints, regardless of resolution | | | | |
|--|---------------|-------------|-------------|--|
| Percent Minority / Complaint Reason | Less than 20% | 20% to 50% | Over 50% | Complaint Rate Ratio (High to Low Minority) |
| Claims | 2.71 | 6.49 | 5.53 | 2.04 |
| Underwriting | .76 | 1.46 | 1.76 | 2.32 |
| Policyholder Service | .29 | .60 | .90 | 3.10 |
| Marketing | .04 | .15 | .16 | 4.00 |
| All Complaints | 3.80 | 8.70 | 8.35 | 2.20 |

| Complaints resulting in a concession to complainant | | | | |
|---|---------------|-------------|-------------|--|
| Percent Minority / Complaint Reason | Less than 20% | 20% to 50% | Over 50% | Complaint Rate Ratio (High to Low Minority) |
| Claims | .97 | 3.13 | 2.02 | 2.08 |
| Underwriting | .17 | .31 | .40 | 2.35 |
| Policyholder Service | .13 | .21 | .29 | 2.23 |
| Marketing | .02 | .03 | .06 | 3.00 |
| All Complaints | 1.29 | 3.68 | 2.77 | 2.15 |

The regression result displayed in Table 7.5 indicate a significant correlation between minority density and complaint rates, for both auto and homeowners insurance. For each one percent increase in minority density, auto complaints per 10,000 exposures increased an average of .0238, and those for homeowners increased .0750. These rates represent the independent and discrete statistical association between racial composition and complaint rates, irrespective of market based and socioeconomic variables, including average incomes and overall losses associated with an area.

Table 7.5: Weighted Stepwise OLS Regression
Dependent Variable: Complaints per 10,000 Exposures (1999-2003)

| Variable | Private Auto | | Homeowners | |
|-----------------------------------|-----------------------|---------|-----------------------|---------|
| | Estimated Coefficient | P-Value | Estimated Coefficient | P-Value |
| Intercept | -1.008 | .0010 | 2.98 | .0002 |
| % Minority | .0238 | .0001 | .0750 | .0001 |
| Median Household Income | D | D | D | D |
| Unemployment Rate | .052 | .0004 | .1960 | .0406 |
| % Adult Pop W/ Some College | -.0105 | .0001 | D | D |
| % Urban | D | D | -.0283 | .0001 |
| % Vehicles | .0571 | .0001 | D | D |
| % Property Vacant | D | D | D | D |
| % Renters | D | D | D | D |
| Median Value Owner Occupied Homes | D | D | D | D |
| Pure Premium | .725 | .0227 | .01108 | .0001 |
| % Pop Below Poverty Level | -.036 | .0001 | -.1839 | .0001 |
| % Households w/out Telephone | D | D | D | D |
| <i>R-Squared</i> | <i>.5810</i> | | <i>.4486</i> | |

Stepwise Regression: variables with p-value greater than .1 removed from model
Zips With Zero Complaints Excluded

VIII: Rating Territories-Private Passenger Auto

Actuaries have long recognized that the risk of loss associated with automobile transportation varies significantly by geography. Territory structures were designed to assess the risk associated with “place,” as opposed to the risk associated with individuals who happen to reside in a place. Such individual factors are already incorporated into rating systems (age, gender, etc), so territory structures ought to represent a pure “contextual” risk, or the risk associated solely with geography (such as traffic density, infrastructure quality, etc). This section examines the rating territories of the top 10 largest automobile carriers in Missouri. Eight companies are presented. Two additional companies use the same territories as those presented.

Among the findings:

- Existing territory structures exhibit a very high degree of racial segregation. Relatively few territories across all companies examined have a racially “mixed” population.
- Territories significantly contribute to the level of automobile premiums in areas with high-minority concentrations. Territories with the highest percent of minorities are generally assessed the highest rating factors of all territories, which can more than double the premium rates found in the most favorable territories.
- While territories have a disproportionate impact upon minorities and raise automobile insurance premiums significantly in core urban areas, they do appear to be actuarially valid. To establish a “base line” against which to assess racial segregation associated with rating territories, territories were constructed using a statistical technique called “cluster analysis” on automobile loss data. The analysis reproduced the high degree of racial segregation present in existing automobile territories. These results suggest that territories correspond to geographic-based risk characteristics that are themselves associated with minority concentration. Geographic components of risk might include traffic density or quality of infrastructure, among other factors, in core urban areas.

Table 8.1 displays minority concentrations of the two most racially segregated territories for each insurer. Many insurers employ territories whose

minority population approaches 90 percent. The most racially segregated territories also tend to have the highest rating factors. Rating factors are highly correlated with minority concentration and moderately correlated with median household incomes (Table 8.2). The linear relationships between minority concentration and rating factors are displayed graphically in Figure 8.1.

Table 8.1: % Minority of Auto Rating Territory Population

| Company | % Minority, First Most Segregated Territory | % Minority, Second Most Segregated Territory |
|-----------|--|---|
| Company A | 80.4% | 77.2% |
| Company B | 79.7% | 77.5% |
| Company C | 88.4% | 84.1% |
| Company D | 81.6% | 77.5% |
| Company E | 81.6% | 78.2% |
| Company F | 85.8% | 81.6% |
| Company G | 84.7% | 83.7% |
| Company H | 88.0% | 79.7% |

**Table 8.2 Correlation Coefficients:⁶ Territorial Rating Factors and
% Minority, Median Household Income**

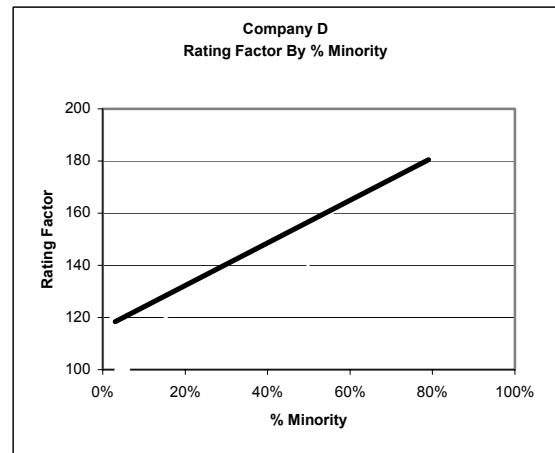
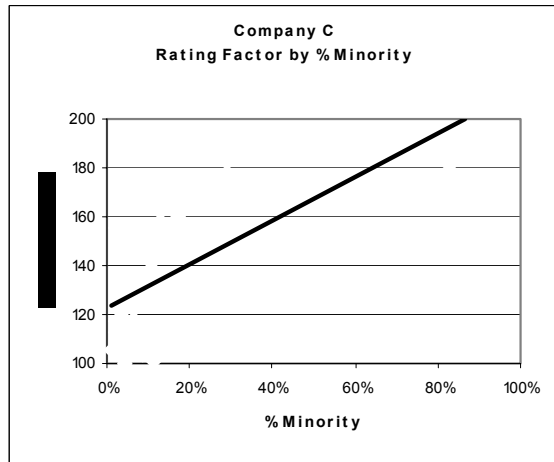
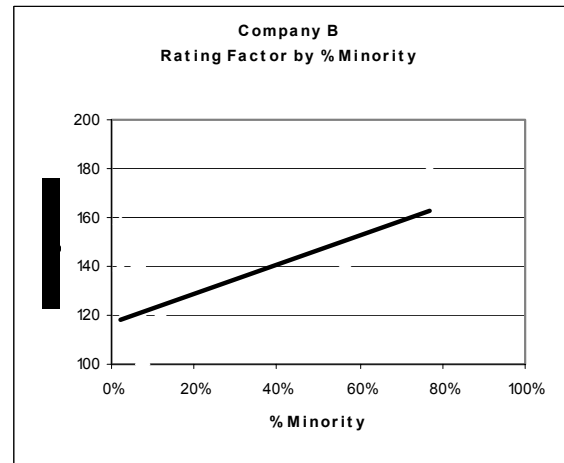
| Company | % Minority | Median Household Income |
|-----------|------------|-------------------------------|
| Company A | 0.6696 | 0.2260 |
| Company B | 0.6885 | 0.06275* |
| Company C | 0.6636 | 0.2962 |
| Company D | 0.5935 | 0.2358 |
| Company E | 0.6987 | 0.1827 |
| Company F | 0.6886 | 0.1967 |
| Company G | 0.6469 | 0.2582 |
| Company H | 0.5676 | 0.05222** |

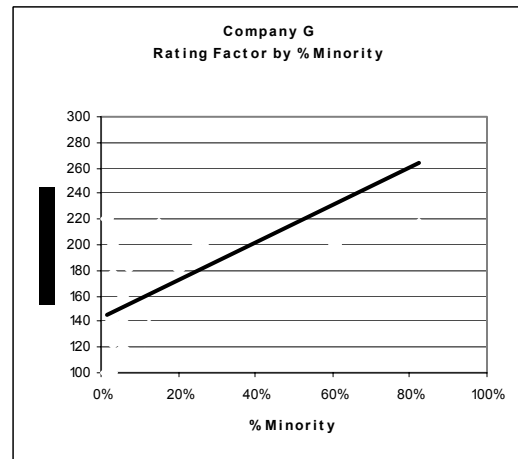
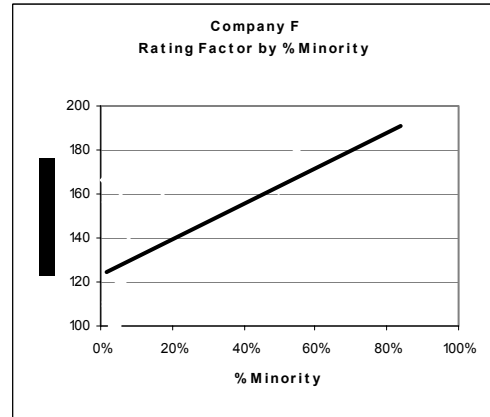
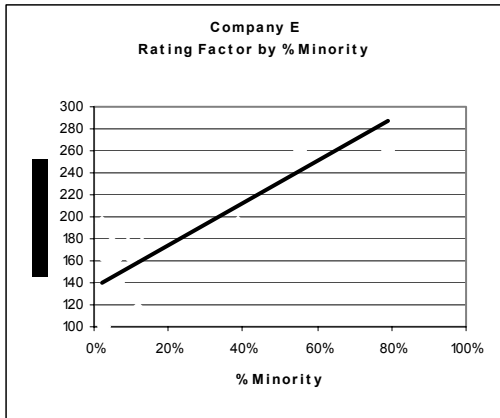
All coefficients significant to the .0001 level, except * (significant to the .05 level) and ** (significant to the .10 level)

⁶ Correlation coefficients range from 0 to 1, with 0 representing the absence of any association between variables, and 1 representing a perfect correlation. A coefficient of 1 indicates that every increase in the value of variable x is associated with a corresponding increase in the value of variable y.

Figure 8.1: Linear Regression: % Minority by Territorial Rating Factors

(Territory rating factors are “normed” to 100, where 100 represents the lowest territorial rating)





Territory structures, while highly segregated along racial lines, do appear to possess actuarial validity and are significantly correlated with losses. Correlation coefficients measuring the association between rating factors and average liability losses per exposure (pure premium) averaged .667 across all insurers (Table 8.3).

Table 8.3: Correlation Coefficients: Liability Pure Premium and Territory Rating Factors (Weighted by Population).

| Name | Correlation Coefficient | P-Value |
|-----------------------------|--------------------------------|----------------|
| Company A | .67448 | .0001 |
| Company B | .61802 | .0001 |
| Company C | .69732 | .0001 |
| Company D | .67449 | .0001 |
| Company E | .69573 | .0001 |
| Company F | .69564 | .0001 |
| Company G | .74030 | .0001 |
| Company H | .53547 | .0001 |
| Average Across All Insurers | .66743 | .0001 |

Tests for statistically significant differences among territories are of limited utility for evaluating the appropriateness of a territorial structure. For all practical purposes, an infinite number of possible territorial combinations is available from 1,000 ZIP codes, many of which will prove significantly correlated with losses.

One alternative evaluative test is to construct a hypothetical territorial structure to use as a “baseline” measure against which existing territory schemes may be assessed. For the purposes of this study, such evaluation is performed along two dimensions:

1. *Actuarial*: do the “baseline” territories perform as well or better than the territories under consideration? Several tests measuring the predictive or explanatory power of various territory schemes are performed.

2. *Social*: do the territories produced via cluster analysis tend to segregate as significantly along racial lines as do actual territories?

Cluster analysis is designed to produce groups whose members are homogenous with respect to a given attribute, while maximizing the degree of heterogeneity **between** groups. In statistical terms, *within-group* variance is minimized while *between-group* variance is maximized. Methodological details are provided in Appendix C.

Clustering was performed on liability average loss per exposure (pure premium). Measures of the predictive power or “efficiency” of territories are based on the proportion of *total variance* in losses across Zip codes accounted for by *between-territory variance*, where *total variance* is the sum of *within-territory* and *between-territory* variances. This “efficiency index” will range from 0 to 1, with 0 being the least efficient, and an index of 1 indicating the highest degree of territorial efficiency. For example, an index of 1 indicates zero variance within each territory, so that all variance in losses is accounted for by dissimilarities between territories. Because of the nature of the technique, adding territories will produce marginally higher indices. A structure of 33 territories was chosen to be comparable to the typical number of territories used by the 10 insurers.

Territorial efficiency indices for each insurer and for the cluster analysis are displayed in Table 8.4. The efficiency of the hypothetical territories produced by cluster analysis is comparable, and in many instances exceeds, the indices associated with insurers’ territories. The index based on 1998-2001 data is indicative of the predictive power of clustered territories produced with pooled 1994-1997 data. The indices satisfy the first criterion: the territory structure derived from cluster analysis is at least as efficient as those currently employed by insurers.

**Table 8.4 Territorial Efficiency Indices
Top Ten Missouri Writers**

| Name | Index, 1994- 1997 | Index, 1998-2001 | Number of Territories |
|-------------------------|----------------------------------|-----------------------------|--------------------------------------|
| Company A | 62.0% | 62.3% | 36 |
| Company B | 61.5% | 61.4% | 36 |
| Company C | 67.2% | 67.6% | 47 |
| Company D | 55.8% | 54.9% | 17 |
| Company E | 62.6% | 63.6% | 30 |
| Company F | 62.0% | 63.0% | 37 |
| Company G | 64.1% | 65.5% | 46 |
| Company H | 50.2% | 47.9% | 16 |
| Cluster Analysis | 82.2% | 63.9% | 33 |

The second criterion, to produce a structure exhibiting a lower degree of racial segregation, was not met. The territory structure produced by clustering tended to reproduce the high degree of racial segregation characteristic of existing automobile insurance rating territories. The indices reported in Table 8.5 represent the percent of the total minority population in Missouri residing in racially concentrated territories, defined as those territories with a higher degree of concentration than the proportion of total Missouri population composed of minorities (16 percent), and territories with minority population greater than 50 percent. The clusters segregated 44.2 percent of Missouri's total minority population into territories with more than 50 percent minority population. This figure roughly represents the median of the territories used by the eight insurers.

One way to more intuitively understand the results is to examine overall residential patterns. In Missouri, 44.9 percent of the state's minority population reside in Zip codes with a minority population of over 50 percent. These Zip codes are located exclusively in the St. Louis and Kansas City areas (see page 6 for listing). Territory structures that tend to group these high-minority Zip codes into one or a few territories will reproduce the overall racial residential patterns in Missouri. Territory structures that incorporate both high minority and more racially mixed Zip codes into single territories will exhibit a significantly lower level of territorial racial segregation. Most companies, as well

as the hypothetical territories produced by cluster analysis, almost exactly reproduce the 44.9 percent figure.

Table 8.5: Racial Segregation Indices

| Name | % of Total Missouri Minority Population Residing in Territories w/ Greater than 16% Minority Population | % of Total Missouri Minority Population Residing in Territories w/ Greater than 50% Minority Population |
|-------------------------|--|--|
| Company A | 65.7% | 44.3% |
| Company B | 64.1% | 39.8% |
| Company C | 74.2% | 55.8% |
| Company D | 85.8% | 45.8% |
| Company E | 65.1% | 36.1% |
| Company F | 63.3% | 43.3% |
| Company G | 68.5% | 46.5% |
| Company H | 59.3% | 28.8% |
| Cluster Analysis | 53.9% | 44.2% |

Additional demographic data for the cluster-derived territories is presented in Table 8.6. The clusters tend to segregate along socioeconomic as well as racial lines, so that the territories with the highest average losses (pure premium) are also the most socially deprived and poorest territories with a high percentage minority population. Much of the risk associated with geography appears to be highly correlated with socioeconomic variables, which are in turn correlated with minority concentration. The correlation coefficients for average losses and minority concentration displayed in Table 8.7 provide evidence for this assertion.

**Table 8.6 Cluster Analysis Derived Territories, Based on Pure Premium
1994-1997
Private Passenger Auto**

| Cluster | % Minority | % Below Poverty | % Unemployed | Per Capita Income | % Without Post-Secondary Education | Average Loss 1994-1997 | Average Loss 1998-2001 |
|----------------|-------------------|------------------------|---------------------|--------------------------|---|-------------------------------|-------------------------------|
| 1 | 11.1% | 5.4% | 4.2% | \$26,599 | 38.3% | \$193 | \$208 |
| 2 | 23.5% | 7.4% | 4.7% | \$23,769 | 45.3% | \$219 | \$227 |
| 3 | 12.6% | 6.4% | 3.7% | \$22,474 | 45.4% | \$170 | \$191 |
| 4 | 66.7% | 24.0% | 11.5% | \$15,483 | 57.7% | \$264 | \$275 |
| 5 | 56.2% | 19.6% | 8.4% | \$17,877 | 51.5% | \$219 | \$236 |
| 6 | 7.8% | 11.0% | 5.4% | \$18,048 | 56.7% | \$153 | \$173 |
| 7 | 4.9% | 5.6% | 4.2% | \$21,993 | 48.4% | \$122 | \$161 |
| 8 | 3.7% | 12.3% | 4.8% | \$17,108 | 59.0% | \$136 | \$166 |
| 9 | 7.1% | 12.4% | 5.4% | \$18,126 | 47.8% | \$184 | \$186 |
| 10 | 9.5% | 10.1% | 4.7% | \$15,770 | 64.7% | \$107 | \$143 |
| 11 | 5.5% | 6.1% | 3.6% | \$21,225 | 50.7% | \$154 | \$180 |
| 12 | 8.7% | 14.2% | 5.4% | \$16,107 | 58.4% | \$138 | \$166 |
| 13 | 5.2% | 14.5% | 5.1% | \$16,051 | 61.7% | \$134 | \$141 |
| 14 | 7.3% | 7.2% | 3.0% | \$20,454 | 51.5% | \$128 | \$150 |
| 15 | 7.9% | 13.7% | 5.2% | \$16,051 | 58.9% | \$123 | \$148 |
| 16 | 9.4% | 17.0% | 5.9% | \$14,003 | 64.1% | \$123 | \$135 |
| 17 | 5.3% | 14.9% | 5.8% | \$15,741 | 60.7% | \$123 | \$145 |
| 18 | 3.2% | 15.3% | 5.4% | \$14,444 | 68.8% | \$103 | \$132 |
| 19 | 6.1% | 18.3% | 7.3% | \$13,579 | 74.5% | \$96 | \$133 |
| 20 | 3.9% | 12.8% | 4.5% | \$15,216 | 62.8% | \$105 | \$122 |
| 21 | 4.4% | 13.1% | 4.4% | \$15,227 | 68.0% | \$94 | \$111 |
| 22 | 3.5% | 14.1% | 6.2% | \$15,199 | 67.5% | \$140 | \$164 |
| 23 | 11.1% | 12.2% | 5.1% | \$17,708 | 58.5% | \$146 | \$163 |
| 24 | 3.7% | 14.3% | 4.6% | \$15,350 | 68.2% | \$144 | \$158 |
| 25 | 5.2% | 12.2% | 10.5% | \$17,671 | 55.3% | \$194 | \$170 |
| 26 | 4.2% | 14.2% | 4.6% | \$14,526 | 66.9% | \$87 | \$136 |
| 27 | 11.3% | 20.8% | 6.8% | \$14,520 | 69.4% | \$150 | \$164 |
| 28 | 3.6% | 14.5% | 4.8% | \$15,061 | 66.1% | \$121 | \$136 |
| 29 | 7.8% | 11.7% | 4.5% | \$17,912 | 57.6% | \$172 | \$170 |
| 30 | 12.9% | 12.6% | 4.7% | \$16,407 | 63.2% | \$125 | \$124 |
| 31 | 19.1% | 26.1% | 6.8% | \$13,961 | 72.8% | \$118 | \$153 |
| 32 | 15.5% | 14.3% | 5.4% | \$18,928 | 38.3% | \$170 | \$174 |
| 33 | 1.9% | 17.4% | 5.0% | \$14,049 | 66.8% | \$57 | \$113 |
| Total | 16.2% | 11.4% | 5.3% | \$19,936 | 51.4% | \$168 | \$184 |

**Table 8.7 Correlation Coefficients: Cluster-Produced Territory Average
Loss and % Minority
Correlation Coefficients**

| Correlation: | Value | P-Value |
|----------------------------|--------------|----------------|
| Pure Premium, 1994-1997 | 0.7096 | 0.0001 |
| Pure Premium, 1998-2001 | 0.7811 | 0.0001 |

Appendix A: Zip Code Correspondences Between Data Sets

The Bureau of the Census adopted a new reporting geography for the 2000 decennial census to replace Zip code level reporting. These new geographic entities, Zip Code Tabulation Areas (ZCTA), closely approximate US postal Zip codes in most, though not all, cases. In some instances, ZCTAs incorporate two or more postal Zip codes. The result is that some Zip codes represented in Missouri Department of Insurance data do not appear in census data. The Bureau of the Census has not released technical documentation of a type that would permit a translation of postal Zip codes to ZCTAs.

For this study, postal Zip codes were matched to ZCTAs based on the longitude and latitude coordinates of Zip code centroids. Postal Zip codes lacking a corresponding ZCTA were mapped by determining the minimum Euclidian distance between Zip code and ZCTA centroids. Sensitivity analysis was performed to measure the significance of using distance mapped Zip codes versus deleting Zip codes lacking a corresponding ZCTA. In all instances, differences were not significant.

Appendix B: Complaint Data

Complaint Propensities Between Differing Populations:

Like all inferences based upon data consisting of a self-selected population, those based on complaint data must be somewhat attenuated. Unlike a survey consisting of a randomly selected sample, the complaint database consists only of industry/consumer conflicts in which consumers actively sought redress from the MDI. While the validity of complaint rates as a measure of consumer dissatisfaction can reasonably be assumed, this study has also assumed that complaint rates accurately reflect the relative severity of underlying problems in insurance markets across Missouri regions. An alternative hypothesis, equally consistent with the data presented, is that urban consumers have a greater propensity to “complain” or, to use more neutral language, seek political redress for perceived unfairness.

In other words, we have assumed that the following two ratios do not vary significantly between designated groups, so that similar proportions of all

individuals with potentially “valid” complaints do in fact register a complaint, regardless of locale. However, given available data, quantities II and IV cannot be verified independently from the complaint data, and their magnitude remains unknown. We cannot rule out definitively the alternative explanation for observed patterns, that a higher proportion of Group A chooses to remain “silent” in relation to conflict with a company, or alternatively, that Group B is simply more vocal.

$$\begin{array}{ll}
 \text{I.} & \text{Number of Complaints for Group A (Known)} \\
 \text{II.} & \frac{\text{Number of Complaints for Group A (Known)}}{\text{Number of Industry Infractions Involving Group A (Unknown)}} \\
 \\
 \text{III.} & \frac{\text{Number of Complaints for Group B (Known)}}{\text{Number of Industry Infractions Involving Group B (Unknown)}} \\
 \text{IV.} &
 \end{array}$$

That reporting rates may vary significantly across population groups is entirely plausible. However, a significant body of research from sociology and political science raises the expectation that poorer urban minority groups would be *less* likely to report problems to MDI. Compared to their middle- and upper-class counterparts, poorer individuals tend to be far more mistrustful of and alienated from governmental institutions. In general, poorer individuals are far less likely to believe that established institutions will work on their behalf, and practical knowledge of available services provided by the state is often lacking. Rates of participation within a myriad of forms of civic institutions, from voting to community organizations, is much reduced among poorer populations (see, for example, the seminal work *Participation in American: Political Democracy and Social Equality*, Sidney Verba and Norman H. Nie. 1987. Chicago: University of Chicago Press).

Evidence also indicates that individuals from high-minority areas are no more likely to make “frivolous” complaints than are individuals residing in low-minority areas. The data presented in Table 7.3 indicate that the relationship between minority concentration and complaint rates remains even when complaint rates are calculated from complaints that resulted in a concession to the consumer.

The percentage of complaints resolved in favor of the consumer is presented in the following tables. For both homeowners and automobile

complaints, the proportion resolved in favor of the consumer is nearly identical for high and low-minority areas.

**Complaint Resolution by Percent Minority
1999-2003**

Homeowners Insurance

| Percent Minority | % of Complaints Resolved in Favor of Consumer |
|-------------------------|--|
| Below 20% | 36.0% |
| 20% to 50% | 26.9% |
| Over 50% | 36.8% |

Automobile Insurance

| Percent Minority | % of Complaints Resolved in Favor of Consumer |
|-------------------------|--|
| Below 20% | 33.6% |
| 20% to 50% | 33.7% |
| Over 50% | 34.6% |

These observations support the contention that complaints are a valid indicator of the relatively increased frequency and/or severity of infractions by the industry in high-minority areas compared to low-minority areas, though alternative interpretations are possible.

Appendix C: Automobile Territories and Cluster Analysis

A wide variety of clustering methods exists. All are designed to produce groupings within data such that within-group variance is minimized while between-group variance is maximized. In other words, the desideratum is to produce an unknown number of groups such that every element within each group is as similar as possible; while elements of different groups are as dissimilar as possible.

A clustering method using non-parametric density estimation was employed to minimize certain statistical biases associated with other clustering methods. Methods based on least-squares minimization tend to select clusters with roughly the same number of observations in each cluster. Average linkage methods tend to produce clusters with approximately equal variances. Density estimation procedures are not bound by such extra-actuarial constraints, and are therefore ideally suited for inductively producing a cluster structure without requiring *a priori* assumptions about the distributional properties of the data.

Initial cluster analysis was performed on private passenger automobile liability average loss (pure premium) in a Zip code based on pooled 1994 to 1997 data. Longitude and latitude coordinates were incorporated into the analysis to constrain the resulting clusters to adjacent Zip codes or Zip codes in close proximity. Analysis using latitude and longitude produced territory structures that possessed significantly greater efficiency and temporal stability of loss characteristics than structures created without regard to the spatial distribution of Zip codes. These results seem to indicate that *spatial arrangement* of territory components provides additional explanatory power over and above the risk characteristics of territory components considered separately. Various tests were conducted to determine how well the clusters derived from 1994-1997 data predicted “future” losses based on 1998-2001 data.

Caveats and data limitations:

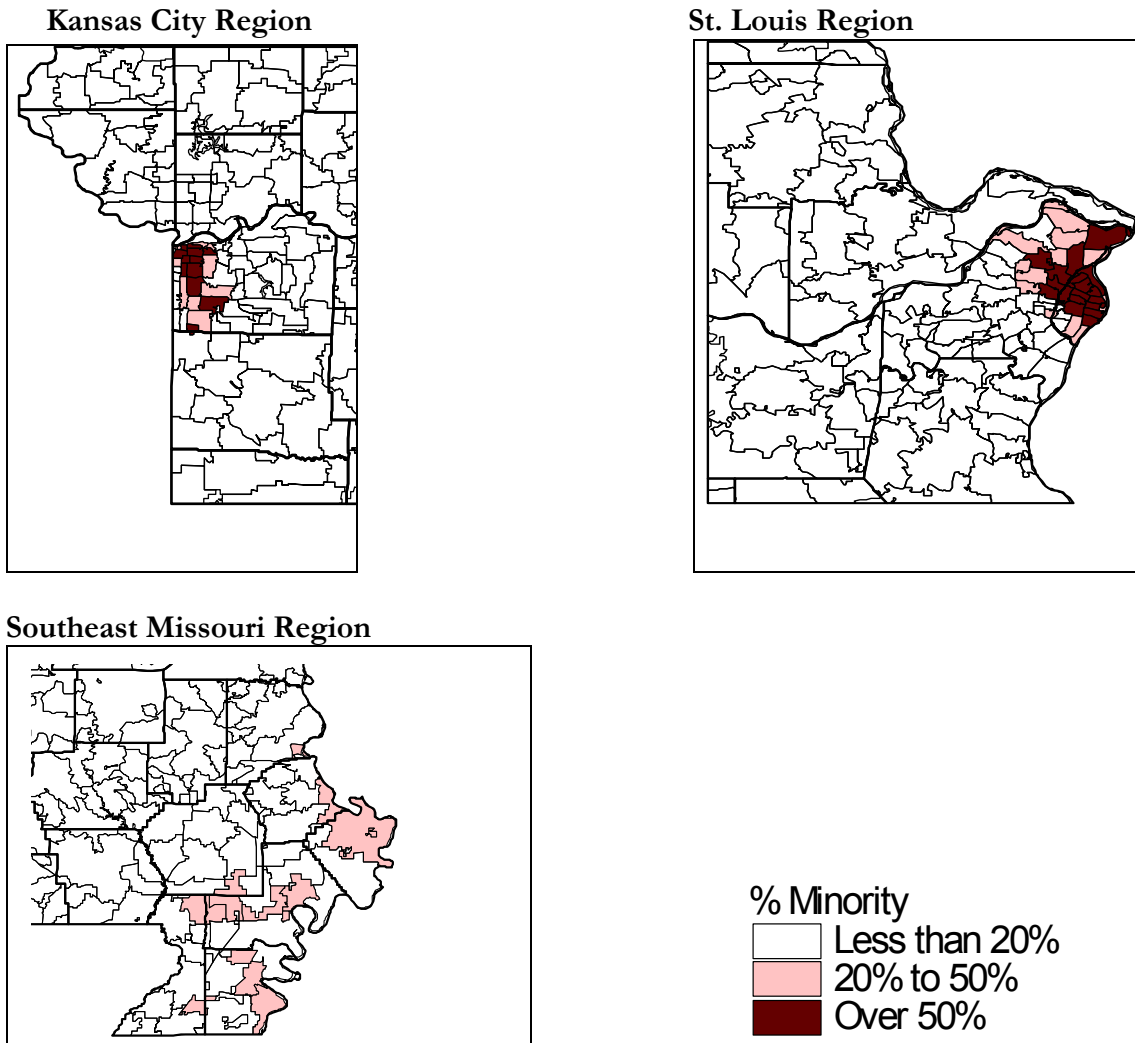
Average losses result from two factors that are in theory separable: individual characteristics and contextual factors (or more lyrically, will and circumstance). Territories should ideally reflect risk associated solely with context or place. Unfortunately, macro-level data do not lend themselves well to disentangling individual and contextual effects. To some extent, we

controlled for individual driver characteristics by analyzing data for “preferred” drivers only.

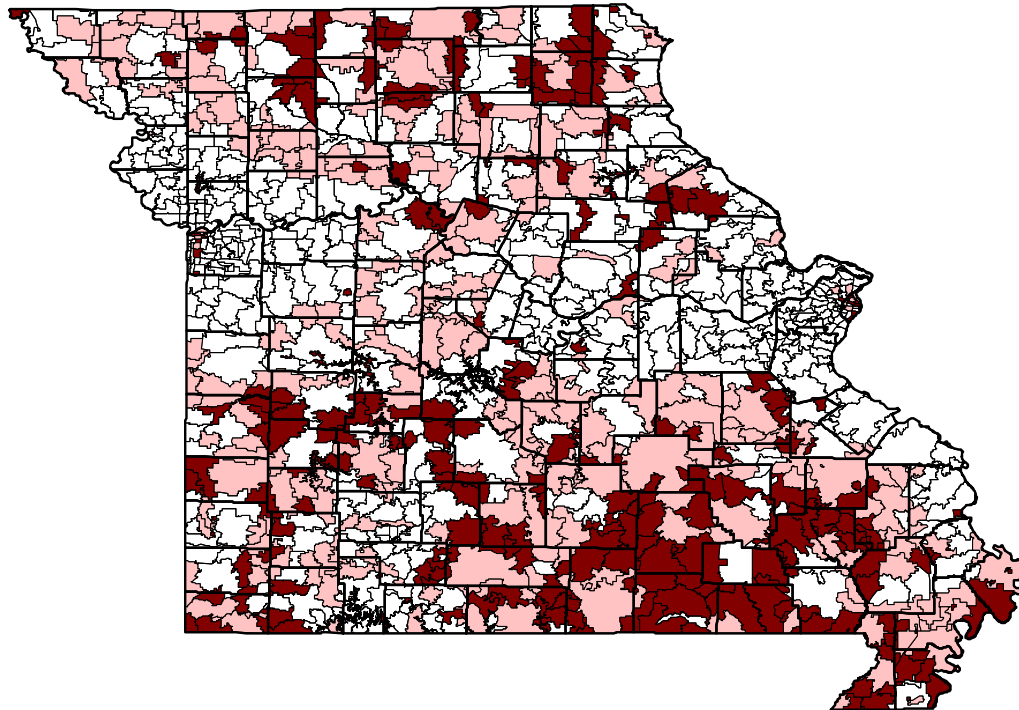
To the extent that individual characteristics associated with risk vary significantly between territories or across time, the territory or contextual effects reported may be somewhat “contaminated.” However, statistical tests on the clusters suggested that our constructed territories provide significant additional explanatory power not accounted for by geographic variation in demographic factors.

Appendix D: Maps of Missouri Demographics

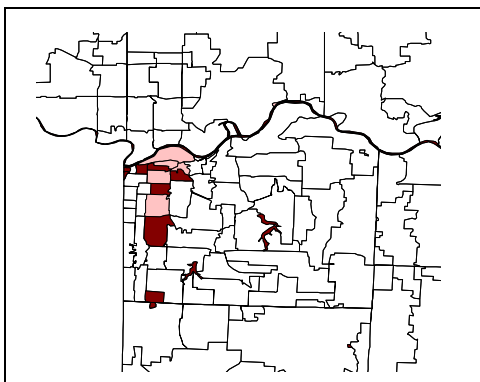
Areas of Missouri With High Minority Concentration



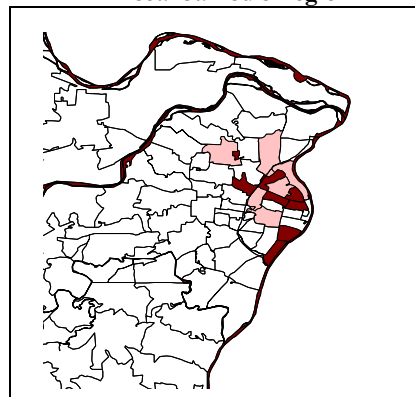
Lower Income Areas of Missouri. Bottom Two Quartiles





Inset: Kansas City Region



Inset: St. Louis Region



-  Bottom Quartile = 253 Zip Codes (out of 1,015), with 562,453 persons, or 10% of 5.6 million Missourians (\$6,153 - \$13,335)
-  Second Quartile = 254 ZIP Codes with 839,281 persons, or 15% of 5.6 million Missourians (\$13,336-\$15,326)